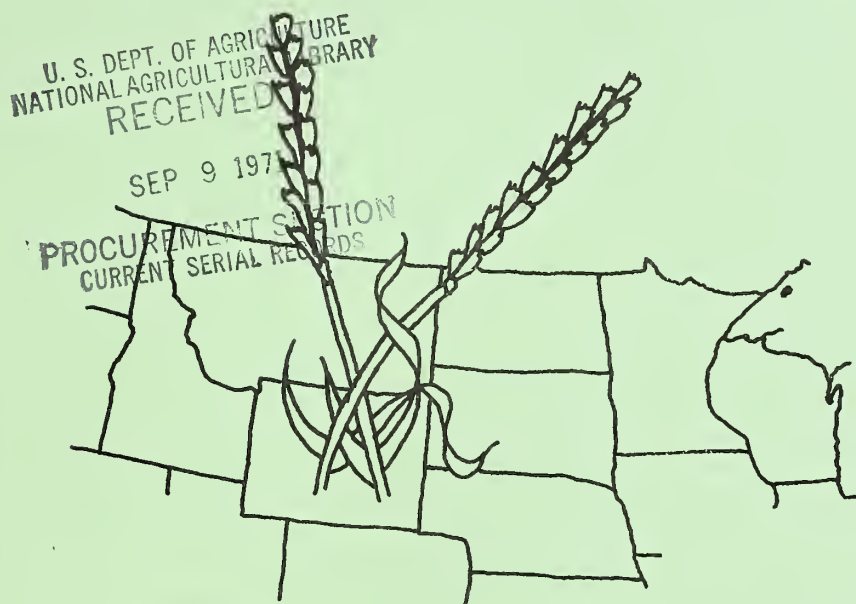


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HARD RED SPRING WHEAT



QUALITY REPORT

Physical, Chemical, Milling, and Baking Characteristics

1970 CROP

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
Plant Science Research Division

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT SCIENCE RESEARCH DIVISION
in cooperation with
State Agricultural Experiment Stations

REPORT OF PHYSICAL, CHEMICAL, MILLING, AND BAKING EXPERIMENTS

WITH HARD RED SPRING WHEAT

1970 CROP^{1/}

by

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1/ This is a progress report of cooperative investigations containing some results that have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. Confirmed results will be published through established channels. The report is primarily a tool for use of cooperators and their official staffs and to those persons having direct and special interest in the development of agricultural research programs.

This report was compiled in the Plant Science Research Division, Agricultural Research Service, U.S. Department of Agriculture. Special acknowledgment is made to the North Dakota State University for their facilities and services provided in support of these studies. The report is not intended for publication and should not be referred to in literature citations nor quoted in publicity or advertising. Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.

Hard Red Spring and Durum Wheat Quality Laboratory
Fargo, North Dakota
PSR-27-71

COOPERATING AGENCIES, STATIONS, AND PERSONNEL

The cooperating agencies and stations conducting the varietal plot and nursery experiments from which the 1970 spring wheat samples were received are listed below:

California Agricultural Experiment Station:

Davis and Walnut Grove.

Minnesota Agricultural Experiment Station:

Crookston, Morris, and St. Paul.

Montana Agricultural Experiment Station:

Bozeman, Conrad, Havre, and Sidney.

North Dakota Agricultural Experiment Station:

Carrington, Dickinson, Fargo, Langdon,
Minot, and Williston.

South Dakota Agricultural Experiment Station:

Highmore and Watertown.

Washington Agricultural Experiment Station:

Lind.

Wisconsin Agricultural Experiment Station:

Madison.

Wyoming Agricultural Experiment Station:

Laramie and Sheridan.

A complete list of all cooperating agencies, stations, and personnel for the year will be found in the report by Dr. R. E. Heiner, "Results on Spring Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1970."



INTRODUCTION

Samples of standard varieties and many of the new strains of hard red spring wheat grown in cooperative experiments in the spring wheat region of the United States^{2/} have been milled each year by the USDA. The flours were assayed chemically and physically and baked into bread to determine the quality characteristics. The purpose of this report is to make available to the cooperators, quality data on the standard varieties and new strains of hard red spring wheat from the 1970 crop.

The same general format and techniques were used in evaluating the wheats as outlined in quality reports for previous years. The data contained in this report are comparable to data in past reports and, where applicable, average results and also the average results of the 1969 crop are compared.

The format adopted in 1962 for the evaluation of a sample utilized three categories: kernel characteristics, milling performance, and baking evaluation. The basic difference between this report and previous reports is the manner in which the ratings were obtained. Previously, the judgment of an individual was used to ascertain the rating; this year, a computer was employed. A brief description of the technique is given on Pages 9 and 10 of this report. It is hoped that with the use of this technique, a more objective evaluation is obtained. Also, it will be possible to quickly deduce the various characteristics of the selection and any outstanding features or deficiencies which are apparent. Again, for physical characteristics, the mixogram data are given with no specific comments made regarding the patterns, since reference mixograms for each of the general types are presented at the end of the report.

Generally, the 1970 crop was grown under favorable conditions but was seeded late due to late rains. The average extraction was about equal to the 1969 crop but the flour mineral content was higher at 65% extraction although the wheat mineral content was approximately the same. (Note: The actual average flour extraction figure is higher in Table 7 for the 1970 crop samples but an adjustment was made in the mill. When the effect of the adjustment is taken into consideration, there would be essentially no difference between the percent extractions for the two crop years.)

The baking performance was poorer than last year. Lower absorption and loaf volume were experienced, even though the protein content of wheat and flour was 0.5% higher. The doughs were slightly weaker than last year which was unexpected because of the higher protein content.

The oxidation requirements for the 1970 crop were somewhat erratic, but on the average requiring approximately 5 p.p.m. bromate.

^{2/} Heiner, R. E., "Results on Spring Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1970." Plant Science Research Division, Agricultural Research Service, USDA.



SOURCE OF THE SAMPLES

Tests were performed on 614 samples received from field plots, uniform regional nurseries, and sawfly yield nurseries of the 1970 crop. These samples originated in eight states: California, Minnesota, Montana, North Dakota, South Dakota, Washington, Wisconsin, and Wyoming. Twenty-one stations from these states were represented, namely, Davis and Walnut Grove in California; Crookston, Morris, and St. Paul in Minnesota; Bozeman, Conrad, Havre, and Sidney in Montana; Carrington, Dickinson, Fargo, Langdon, Minot, and Williston in North Dakota; Highmore and Watertown in South Dakota; Lind in Washington; Madison in Wisconsin; Laramie and Sheridan in Wyoming.

Due to apparent differences in the characteristics of the wheats and protein contents, no samples were blended this year.

On page 5 are listed the spring wheats which were included in the 1970 Uniform Regional Nursery trials. The variety or cross, the station which developed the variety, the state selection number, and the C.I. number are given.

In Table 19 are given the average data for the Uniform Regional Nursery samples. The data for kernel characteristics and milling performance are arithmetical averages of the individual samples. However, the mixograms and baking data were obtained from blends of equal proportions of the individual flours for each sample from the 17 stations.

In Table 23 are given the average data for the Sawfly Yield Nursery samples obtained from the arithmetical averages of the individual samples.



ENTRIES FOR THE 1970 UNIFORM REGIONAL HARD RED SPRING WHEAT NURSERY

Entry No.	Cross or Variety	C.I. or Sel. No.	Year Entered	Source
1	MARQUIS	3461	1929	Canada
2	JUSTIN	13462	1959	ND
3	SELKIRK	13100	1953	Canada
4	CHRIS	13751	1960	USDA-MN
5	NEEPAWA	RL4200	1967	Canada
6	FTA/61-107	S6579	1968	USDA-ND
7	ND140/ND363	ND490	1970	ND
8	ND140/ND363	ND491	1970	ND
9	ND363/ND269	ND496	1970	ND
10	ND259/CLY//CLY/ND122/3/JT/ND142	ND487**	1970	ND
11	JT*2/4/ND259/CLY//CLY/ND122/3/JT/ 5/ND363	ND499**	1970	ND
12	PJ60/3/HRY*7/P54//K184/7*WIS250/ 4/K184/4*WIS250	WIS271**	1967	USDA-WI
13	do	H678-1-6-9**	1969	USDA-WI
14	NRN10/BVR14//6*CNT	MT6723**	1969	USDA-MT
15	SI/3/NRN10/BVR14//5*CNT	MT6830**	1970	USDA-MT
16	do	MT6834**	1970	USDA-MT
17	FTR/3/NRN10/BVR14//5*CNT	MT6839**	1970	USDA-MT
18	ERA**	13986	1968	USDA-MN
19	FLETCHER**	13985	1968	USDA-MN
20	WORLD SEEDS 1812**	14585	1970	World Seeds, Inc
21	BONANZA**	14077	1970	DeKalb Ag. Res.
22	69I157**		1970	Northrup King

** Semidwarf

METHODS

The terminology and methods used are briefly described below:

Test Weight Per Bushel - The weight per Winchester bushel of cleaned, dry, scoured wheat. To determine the dockage-free test weight on a comparable sample, approximately one pound per bushel should be subtracted from the value given.

1000 Kernel Weight - The 1000 kernel weight was determined by counting the number of kernels in a 10 gram sample of cleaned, picked wheat with an ASCO Seed Counter^{4/}.

Kernel Size - The percentages of the size of the kernels (large, medium, and small) were determined on a wheat sizer as described by Shuey^{5/}.

The sieves of the sizer were clothed as follows:

Top Sieve	-	Tyler # 7 with 2.92 mm. opening
Middle Sieve	-	Tyler # 9 with 2.24 mm. opening
Bottom Sieve	-	Tyler #12 with 1.65 mm. opening

Potential Yield - The potential yield is not shown on the computer tables but it can be determined by multiplying the percentages of the overs of each sieve #7, #9, and #12, by the value of 78%, 73%, and 68%, respectively. The accumulation percentage would be the potential yield.

Milling - The samples were cleaned by passing the wheat over an Emerson Kicker and Dockage Tester and through a modified Forster Scourer Model 6. The clean dry samples were pre-tempered to 12% moisture for at least 72 hours; then tempered to 16% moisture and allowed to stand overnight prior to milling.

All samples except the advanced yield nursery and field plot samples were milled on a Brabender Quadrumat Junior Mill. The mill was equipped with a #18 wire on the drum sieve. The troughs of the #18 wire were rebolted on a Strand Sifter equipped with a #60 Tyler sieve. The sample was sifted for 1 minute. The troughs of the #60 wire were classified as flour and this was the material tested. The overs of the #18 wire were classified as bran and the troughs of the #18 wire and overs of the #60 Tyler sieve as crude shorts.

The field plot and advanced yield nursery samples were milled on a Buhler Continuous Experimental Mill. This mill has been slightly modified

^{4/} Mention of a trademark name or a proprietary product does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture, and does not imply its approval to the exclusion of other products that may also be suitable.

^{5/} Shuey, William C. A Wheat Sizing Technique for Predicting Flour Milling Yield. Cereal Science Today 5: 71-72,75 (1960).



to give results more comparable to commercial milling. The break scalping sieves were clothed with #54 stainless steel wire, the reduction scalping sieves with #58, #66, and #105 stainless steel wires for the first, second, and third reduction, respectively. All of the flour sieves were clothed with #135 stainless steel wire.

All six flour streams were combined to give the patent flour. The extraction of a good milling wheat using this flow is approximately 68%. This is comparable to a commercial "long patent" extraction flour. At this flour extraction of the wheat, the changes in flour ash are most sensitive to changes in percent extraction.

Protein Content - The protein was calculated by multiplying the factor of 5.7 times the percent nitrogen as determined by the standard Kjeldahl procedure.

Mineral Content or Ash Content - This was determined by measuring the residue of the minerals left after incinerating the sample for approximately 16 hours at 565° C. The results were reported as percentage of the sample which was incinerated.

Mixogram - The mixogram was determined by using 30 g. of flour and adding 20 cc. of water. The sensitivity spring setting was set at 10. All mixograms were run with constant weight of flour and volume of water. Absorptions reported were adjusted according to the height of the mixogram. The correction factor was determined from a series of flours by varying the amount of absorption.

Mixogram Pattern - The reference mixogram patterns given at the end of the report demonstrate the different types of mixograms which were obtained. A single number is assigned each pattern to characterize and simplify the classification of the curves - the larger number indicating stronger curve characteristics.

Baking Procedure or Formula - The baking formula used was as follows:

100% flour	3% milk D.S.M.
2% salt	3% yeast
5% sugar	2% shortening (Crisco, melted)

The sample was mixed to development in a National Manufacturing mixer, for the 25 g. sample the Micro mixer, for the 100 g. sample the 100 g. special mixer size. Also, 10 p.p.m. of bromate and 0.1% Barley Malt Flour was used for oxidation and enzymatic supplements, respectively.

Absorption - This was the water, expressed as percent of the flour, required to bring the dough to proper consistency.

Crumb Color - This value was determined by comparing the loaf of the tested sample against a baking standard. This standard was selected as an average for the crop year for the spring wheat area.



Loaf Volume - This was volume of the baked loaf as determined by seed displacement.

All values (Protein, Ash, and Absorption) were reported on a 14% moisture basis.



DISCUSSION

The following discussion presents some of the basis for the techniques and criteria used in evaluating the samples. There are four major evaluation categories used: kernel characteristics, to characterize the kernel; milling performance, to evaluate the general milling characteristics; mixogram patterns, to classify the flour as to type; and baking evaluation, to rate the flour as to overall baking.

Each evaluation category can be important. A sample could be of a sufficiently poor quality for a given category to eliminate it from possible future testing. However, a sample submitted for the first time and found to be questionable should be tested again to establish if it has a satisfactory or unsatisfactory classification. A sample which is consistently rated as questionable should be discarded.

Seven hundred and forty-nine previously evaluated uniform regional nursery samples were selected to develop a quality evaluation program for the computer. The samples represented 5 crop years, 7 states, 21 stations, and 33 series. Chris, Justin, and Selkirk were selected as the standard varieties for each series. The percent deviation of each independent variable varied from the mean of the standard varieties was determined. Limits consistent with previous data obtained on the 749 samples were established for each independent variable. Nebraska regressions were run to establish the regression coefficients of each variable.

Six characteristics (test weight, 1,000 kernel weight, percent large kernels, percent small kernels, wheat mineral, and wheat protein) were independent variables used to calculate the dependent variable - Kernel Characteristics. Four characteristics (percent extraction, mineral @65% extraction, milling characteristic, and protein difference between flour and wheat protein) were used to calculate the dependent variable - Milling Performance. Bake absorption, mixing time, dough characteristics, crumb color, crumb grain, and loaf volume were the six independent variables used to determine the dependent variable - Baking Evaluation. These three dependent variables after calculation become independent variables, used to calculate the dependent variable - General Evaluation.

The three dependent variables, Kernel Characteristics, Milling Performance, and Baking Evaluation are rated on a scale of 1 to 8, with 1 being Very Satisfactory and 8 being Unsatisfactory. The General Evaluation is rated on a scale of 1 to 4, with 1 being no promise; 2, little promise; 3, some promise; and 4, good promise. If one of the independent variables conver value is 8 (with the exception of crumb color), this automatically will rate the General Evaluation as 1, or no promise. If there are no 8's, the three values are employed in a regression equation to derive the General Evaluation. The weighted value for each of these variables on the General Evaluation are approximately 6% for Kernel



Characteristics, 47% for Milling Performance, and 47% for Baking Evaluation.

To quickly point out problem areas for a selection, two additional columns have been added to the printout. One column is minor deficiencies in which the independent variables converted to a 5 or 6, that is Questionable or Questionable to Unsatisfactory will appear. The second column is major deficiencies in which the independent variables were converted either to a 7 or 8, that is Unsatisfactory to Questionable and Unsatisfactory. Deficiencies of the various selections may be readily determined by scanning these columns. It is also possible to have one or two independent variables that would appear in the major deficiency column, rating 7 and should be given serious consideration, but they still did not influence the general rating sufficiently to rank the selection as having no promise.

All samples, as in previous years, are compared to a milling and baking standard which represents a blend of the crop year blended to a known quality. However, the samples for the individual stations are evaluated against the average results of the check varieties from the respective stations. The agronomic and climatic conditions of the individual locations can effect the quality of the wheat sample, such that, the evaluation at certain locations could have all samples -- even the named varieties -- classified as questionable to unsatisfactory. Therefore, the evaluation ratings of one station are not directly comparable to those of another station. For example, an area may produce low protein wheats which give large and plump kernels, good milling and kernel characteristics, but low protein and unsatisfactory baking properties such as short mixing time, low loaf volume, and weak dough characteristics. The wheat from this area could not be considered as a strong spring wheat, and would not maintain the quality expected from the spring wheat producing area. A good variety should have tolerance to a wide range of environmental conditions and the overall picture taken into consideration for establishing these varieties.

Kernel Characteristics are important in determining the initial value of the wheat and, if extremely poor, could disqualify a new variety from further consideration. Because of the present grading system, it is desirable to have a good test weight. If a sample has a low 1,000 kernel weight and small kernel size distribution, it would be considered a poor sample for milling because of the high ratio of bran to endosperm. Therefore, it is desirable to have plump kernels. Wheat ash is an important factor when comparing a variety against other standard varieties. If a sample would have consistently higher wheat mineral content, it would enhance the probability of having high flour ash. Low protein would not be desirable when comparing with standard varieties, because in a low protein crop year the probability of it having such a low protein as to be undesirable is very probable. Therefore, the protein must also be considered as a characteristic when comparing other varieties grown in the same locality.



Milling Performance is very important, especially the sub-category of milling characteristics. If low extractions or high flour ash are obtained, this becomes a major factor and is quite unacceptable from a commercial milling standpoint. All flour mineral contents are reported at a constant extraction of 65% so that the figures are directly comparable. As a rule of thumb, one can approximate that each point of ash (0.01%) is equivalent to approximately 2% in extraction.

Milling characteristics are important. A sample which tends to be soft in character requires a different milling technique to be milled properly. On commercial mills flowed for hard vitreous spring wheats, soft milling characteristics cause great difficulty. Therefore, if a sample shows softness in character, it is considered to be unsatisfactory. Likewise, a sample which is extremely hard and vitreous will cause difficulty. Both types of wheat (soft and vitreous) require different roll pressures, clothing, sifter surface, and temper to be milled properly. If these wheats are blended with normal milling wheats, improper results are obtained since these characteristics are not necessarily compatible or additive. Normal to soft score indicates that the sample shows a tendency toward softness of character on the flour mill stocks and extraction. This would indicate that the sample may give some difficulty for certain mill streams and an adjustment would either have to be made in the milling flow, or in tempering procedures to compensate for these differences. The properties of this wheat may or may not be compatible with other wheats with which it may be blended, therefore, it is important to maintain varieties with as uniform milling characteristics as possible.

The amount of protein recovered in the flour for a sample is of importance. The high protein wheats yielding low protein flours are not desirable. Such a wheat would have much of the protein distributed in the outer portion of the kernel which would result in excessive protein in the feed. Therefore, higher protein in the wheat would be necessary to yield a flour of comparable protein to a wheat which gives good flour protein recovery.

Mixogram Patterns and Farinogram Patterns are important in estimating the strength and mixing tolerance or potential mixing tolerance of a flour. A long flat curve is more desirable than a short peaked curve; however, an extremely long curve may be undesirable, if the flour would require excessive mixing for proper development. The pattern of the curve is of importance as well as the length, and both must be considered. An abnormal curve, such as a sway-back or long initial time to incorporate the water, indicate undesirable characteristics.

Baking Evaluation takes into account the flour absorption, mixing time, dough characteristics, loaf volume, and machinability. A sample which has low absorption would be unsatisfactory, compared to other spring wheats with normal absorption. A sample with extremely short mixing time would also be considered undesirable as a good strong spring wheat. When a sample is in the minimal range for these values, it is considered as questionable until further testing demonstrates whether a definite deficiency exists.



Doughs having mellow to weak dough properties show a tendency towards weakness. Also, for mellow to strong, the dough is mellow but has a tendency to be strong, and a strong to mellow dough is just the reverse. Since these characteristics are subjective rather than objective, it is necessary at times to estimate the tendency; therefore, the necessity exists for apparent double grades.

The grain or appearance of the interior of the loaf shows how well the sample stood up during baking and may point out or explain some deficiencies which have been observed during the baking test.

Loaf volume indicates potential strength of the flour in a different manner than mixing time or dough characteristics, in that it shows the ability or lack thereof for the dough to expand under pressure and to contain the entrapped gases during this expansion. Weak flours act much like rotten balloons which burst when blown up and collapse, thus yielding low loaf volume or extremely large volume and large holes in the interior of the loaf. Low protein flours and lifeless (dead) doughs exhibit the properties similar to putty and do not expand during fermentation or baking and give low loaf volume. Tough and very bucky doughs are bound too tight and impede expansion of the gases causing low loaf volume.

General Evaluation rating applies only to the data contained in the year of the report. A new category, The Prospect of a selection, will apply to two or more years of data. The Prospect is given for each selection which has been tested for at least two crop years. This evaluation takes into account the various grading factors and the results of the crop years in an effort to determine if the selection should be considered as a prospective new variety. The main defects and outstanding features are discussed. A selection which is promising should be continued. Those which show some promise with outstanding agronomic characteristics should be seriously considered and looked at in large plots, if it has not been previously, providing other sufficient information has been obtained. A sample which shows little or no promise should be discontinued.



FIELD PLOT NURSERY SAMPLES - 1970 CROP

One hundred and seventy-four field plot nursery samples were received from three states and seven stations. The data for the individual samples are given in Tables 1 through 6. In Table 7, are given the averages for the varieties by state for the following varieties: Chris, Justin, and Selkirk for North Dakota. The averages for California are not given due to the fact that all of these varieties were semidwarfs, with the exception of Chris. The Wisconsin data was not included since only one station, as well as one check variety (Selkirk), was received. The averages for these commercial varieties per location were used as standards for judging the other samples in the field plots. The milling and baking standard Chris blend was used for those samples which did not have comparable grown check varieties. The 1969 and 1970 averages also are given for varieties from the state of North Dakota.

CALIFORNIA SAMPLES

Thirty-eight samples were received from the Davis and Walnut Grove, California stations. All of these samples were named varieties, semi-dwarfs or semidwarf selections, with the exception of Chris. The named varieties were: Azteca 67, Calidad, Ciano 67, Inia 66, Maxigene 1877, Siete Cerros 66, Sonalika, Tobari 66, and the Bluebird series. Those selections or varieties not discussed independently should be discarded as showing no promise. The results for each variety are given in Tables 1 and 2.

Azteca 67

Kernel Characteristics - Questionable to Satisfactory. Tendency towards small kernels and low protein.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Tendency to have poor crumb grain and low loaf volume.

General Evaluation - Based on this crop year's results, this selection would show some promise in the California area. Although it does have minimum protein and a tendency towards minimum loaf volume.

Calidad

Kernel Characteristics - Satisfactory to Questionable. Tendency towards low protein.

Milling Performance - Satisfactory.



Calidad (Cont'd.)

Baking Evaluation - Unsatisfactory to Satisfactory. Erratic results.

General Evaluation - Based on this year's crop results, this variety would show little promise as a variety for California due to the erratic results of both strong and weak doughs and low loaf volume.

Ciano 67

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. There is a tendency towards low loaf volume.

General Evaluation - Based on this year's crop results and other year's results, this variety continues to show good promise for the California area. It does however, on occasion, show a tendency toward strong doughs.

Inia 66

Kernel Characteristics - Questionable. Tendency towards low protein.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable to Satisfactory. Tendency towards weak doughs and low loaf volume.

General Evaluation - Based on this year's crop results and other results from previous years, this variety shows some promise in the California area though it does have a tendency towards low protein which, in turn, is reflected in the dough characteristics and loaf volume.

Maxigene 1877

Kernel Characteristics - Satisfactory.

Milling Performance - Very Satisfactory.

Baking Evaluation - Questionable. Tendency towards weak dough and minimum loaf volume.

General Evaluation - Based on this crop year's results, this variety would show some promise in the California area; however, it should be grown in more than one location to observe its adaptability and general characteristics.



Bluebird No. 2

Kernel Characteristics - Questionable. Low protein.

Milling Performance - Very Satisfactory.

Baking Evaluation - Questionable. Tendency towards weak dough and low loaf volume.

General Evaluation - Based on this year's results, this selection would show some promise as a new variety, although it does have a tendency toward minimum protein in a low protein area and tendency for a weak dough.

Bluebird No. 7

Kernel Characteristics - Questionable. Tendency for low protein.

Milling Performance - Satisfactory to Questionable. Minimum protein recovery in the flour.

Baking Evaluation - Questionable. Tendency towards weak dough, low bake absorption, loaf volume and poor crumb interior.

General Evaluation - This selection may show some promise as a new variety based on this year's results. However, it does show a definite tendency in a low protein area to be too low in protein and give poor results, while in a high protein area it does give minimum satisfactory results.

7021

Kernel Characteristics - Satisfactory to Questionable. Minimum protein.

Milling Performance - Very Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Tendency for slightly poor interior and low loaf volume.

General Evaluation - Based on this crop year's results, this selection would show good promise as a new variety. Although it does tend to have minimum protein in a low protein area.

7022

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory. Does tend to have a minimum loaf volume.



7022 (Cont'd.)

General Evaluation - Based on this crop year's results, this selection would show good promise as a new variety. Although the data for this sample was obtained from only one locality in the high protein area and it does show a minimum protein.

7052

Kernel Characteristics - Questionable. Minimum protein.

Milling Performance - Very Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Tendency towards low loaf volume.

General Evaluation - This selection would show good promise as a new variety based on this crop year's results, even though it does have a tendency towards low protein and low loaf volume; however, these data were obtained from a low protein environment.

7062

Kernel Characteristics - Questionable. Tendency towards small kernels and low protein.

Milling Performance - Questionable to Unsatisfactory. Tendency towards low extraction and maximum ash at 65% extraction.

Baking Evaluation - Satisfactory.

General Evaluation - This selection, based on this crop year's results, would show some promise as a new variety. Although if the small kernels, low protein, low extraction, and maximum ash continue it would show no promise.



NORTH DAKOTA SAMPLES

One hundred and twenty-six samples were received from the Carrington, Dickinson, Fargo, and Williston, North Dakota stations. Eighty-four of these samples were the named varieties: Bonanza, Canthatch, Chris, Crim, Era, Fletcher, Fortuna, Justin, Manitou, Neepawa, Polk, Red River 68, Selkirk, Thatcher, Waldron, Wamduska, GWO 1809, GWO 1812, and Cargill 208 or Bounty 208. Forty-two of the samples were the selections: Northrup King AB 6770, DeKalb FB6, ND 487, ND 491, ND 496, ND 497, S6579, S6763, W255, and W271. The samples from Carrington were grown on both dryland and irrigated land. The results for each variety and selection are given in Tables 3, 4, and 5. The average results of the 1970 data are given in Table 7.

AB 6770

Kernel Characteristics - Satisfactory. Tendency towards small kernel size and wheat protein.

Milling Performance - Unsatisfactory to Questionable. Low extraction, high protein differential between wheat and flour, and high flour ash at 65% extraction.

Baking Evaluation - Questionable. Tendency towards weak doughs and low loaf volume.

General Evaluation - Based on this crop year's results, this selection would show no promise as a new variety.

DeKalb FB6

Kernel Characteristics - Satisfactory to Questionable. Tendency towards small kernels, low kernel weight and low wheat protein.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. Tendency towards erratic dough characteristics and low loaf volume.

General Evaluation - Based on this crop year's results, this selection would show little promise as a new variety, due to the questionable kernel characteristics and the erratic baking results.

ND 487

Kernel Characteristics - Satisfactory.

Milling Performance - Very Satisfactory.



ND 487 (Cont'd.)

Baking Evaluation - Satisfactory to Questionable. Tendency towards strong doughs and minimum loaf volume.

General Evaluation - This crop year's results indicate that this selection would show some promise as a new variety.

The Prospect - Based on two crop years' results, the selection would still show some promise. The deficiencies for one crop year are slightly different than for the other. Minimum protein and a tendency towards minimum mixing time were characteristics of the 1969 crop, however, a tendency towards too strong a dough is observed for the 1970 crop which was favorable for higher protein also.

ND 491

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory to Questionable. Tendency towards low extraction and in one instance showed a high ash at 65%, as well as too great a spread between protein of the flour and the wheat.

Baking Evaluation - Questionable to Satisfactory. Dough characteristics tend to be erratic.

General Evaluation - Based on this crop year's results, this selection would show little promise as a new variety.

The Prospect - Based on two crop years, this selection would show little promise due to milling performance which tends to be somewhat erratic from year to year.

ND 496

Kernel Characteristics - Satisfactory to Questionable. Tendency towards too small a percentage of large kernels.

Milling Performance - Satisfactory to Questionable. High ash at 65% extraction.

Baking Evaluation - Questionable to Satisfactory. Tendency towards weak doughs.

General Evaluation - Based on this crop year's results, this selection would show little promise as a new variety since it tends to be deficient in all three categories.



ND 497

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory with a tendency to give too great a spread between the flour and wheat protein.

Baking Evaluation - Unsatisfactory to Questionable, showing poor crumb grain interior, low loaf volume, weak doughs and low bake absorption.

General Evaluation - This selection would show little promise due to generally minimum baking performance.

S6579

Kernel Characteristics - Satisfactory to Questionable. Tendency towards low protein, large percent of small kernels and small percent of large kernels.

Milling Performance - Satisfactory with a tendency to show maximum ash at 65% extraction.

Baking Evaluation - Questionable to Satisfactory. Bake absorption minimum and the dough strength maximum.

General Evaluation - Based on this crop year's results, this selection would show little promise as a new variety tending to be deficient in at least two categories.

The Prospect - This selection would show little promise as a new variety based on three crop years' because of its tendency to give erratic results. Two of the crop years it had a tendency to show low absorption and dough faults.

S6763

Kernel Characteristics - Satisfactory to Questionable. Tendency towards low test weight.

Milling Performance - Satisfactory to Questionable. Tendency to give low extraction.

Baking Evaluation - Satisfactory. Tendency to give minimum mixing time.

General Evaluation - Based on this crop year's results, this selection would show some promise as a new variety although it does have some tendencies of deficiency in the three categories and was only grown at one location.

Wisc. 255

Kernel Characteristics - Satisfactory to Questionable. Tendency towards small kernels.

Wisc. 255 (Cont'd.)

Milling Performance - Satisfactory to Questionable. Tendency towards maximum ash.

Baking Evaluation - Questionable. Tendency towards weak doughs and, in one instance, low absorption.

General Evaluation - Based on this crop year's results, this selection would show little promise as a new variety showing a tendency for deficiencies in all categories.

The Prospect - Based on previous years' results, this variety still shows a tendency to have minimum quality characteristics in almost every category and shows little or no promise as a new variety.

Wisc. 271

Kernel Characteristics - Questionable. Low protein and large percentage of small kernels.

Milling Performance - Very Satisfactory.

Baking Evaluation - Questionable. A tendency to show low absorption, strong doughs.

General Evaluation - Based on this crop year's results, this selection would show little promise as a new variety as it tends to give somewhat erratic results and to be slightly on the strong side.

The Prospect - Based on three crop years' results, this selection would show little promise due to the erratic results, showing a tendency for low protein, long mixing time and low absorption.



WISCONSIN SAMPLES

Eight samples were received from the Madison, Wisconsin station. Four of the samples were the named varieties: Bonanza, Era, Polk, and Selkirk; also included was a Chris standard that was used as a check along with the Selkirk variety. This gave a more realistic evaluation of samples from a spring wheat viewpoint. Three of the samples were the semidwarf selections H678-1-6-9, Wisc. 261, and Wisc. 271, while the fourth sample was the standard height variety, Wisc. 255. The results of these samples are given in Table 6.

H678-1-6-9

Kernel Characteristics - Questionable to Unsatisfactory. Low test weight, high mineral ash and low wheat protein.

Milling Performance - Very Satisfactory.

Baking Evaluation - Questionable to Unsatisfactory. Weak dough and low bake absorption.

General Evaluation - Based on this year's results, this selection would show some promise as a new variety. However, it does have some minor deficiencies with a major deficiency of low protein and bake absorption. If the Selkirk variety were not included in this series, it would definitely show no promise, due to low protein and low bake absorption.

The Prospects - This selection, based on two crop years' results, would show some promise as a new variety when compared with other comparably grown samples from Wisconsin; however, it does show a tendency to have minimum protein content and absorption which would not be desirable for other spring wheat areas and would result in a little or no promise prospect.

Wisc. 255

Kernel Characteristics - Satisfactory.

Milling Performance - Unsatisfactory. High flour mineral content at 65% extraction and large spread between wheat protein and flour protein.

Baking Evaluation - Questionable. Dough tends to be too strong.

General Evaluation - Based on this year's results, this selection would show no promise due to the high flour mineral content at 65% extraction. It does, however have the highest wheat protein and bake absorption, as well as loaf volume of the various selections studied in this series. The high mineral content of the wheat is reflected in the high mineral content of the flour, but the sample did show a tendency towards low extraction.



Wisc. 255 (Cont'd.)

The Prospect - Based on previous performances of this variety, this sample does have the best baking characteristics of the series submitted from Wisconsin. However, it has shown, in the past, high flour mineral content due to the high wheat mineral content; because of this, the selection shows little promise as a new variety, although the kernel characteristics and baking evaluation have been satisfactory in the past.

Wisc. 261

Kernel Characteristics - Unsatisfactory to Questionable. Low test weight, high mineral content, low wheat protein.

Milling Performance - Very Satisfactory.

Baking Evaluation - Unsatisfactory to Questionable. Low bake absorption and tendency towards strong dough.

General Evaluation - Based on this crop year's results, this selection would show little promise as a new variety, even though it does have excellent milling properties. The low bake absorption reflects the low protein content.

The Prospect - Based on three crop years' results, this selection would show no promise as a new variety due to the relatively consistent low protein and low bake absorption in two of the three years tested.

Wisc. 271

Kernel Characteristics - Questionable. Low protein.

Milling Performance - Very Satisfactory.

Baking Evaluation - Unsatisfactory to Questionable. Low bake absorption and loaf volume.

General Evaluation - This year's results show this selection to have little promise as a new variety, due to low protein, low bake absorption and loaf volume. It also had the poorest crumb color of the selections tested.

The Prospect - Based on two crop years' results, this selection would show little promise due to erratic results showing a tendency for low protein, long mixing, low absorption and occasional low loaf volume.



UNIFORM REGIONAL NURSERY SAMPLES - 1970 CROP

A total of 369 Uniform Regional Nursery samples were received. The samples represented 17 stations from seven states. No blends were made of the samples for this crop year due to the lack of compatibility and were milled as individual samples to eliminate any possible erroneous results. Thus, a total of 369 samples were milled and baked. Twenty-two samples were received from each of the stations, except the Crookston and Morris, Minnesota series which consisted of only 21 samples, and the St. Paul, Minnesota series which had 19 samples. Thirteen selections were included for quality evaluation in the Uniform Regional Nursery samples. The remainder of the samples were the commercially named varieties of: Bonanza, Chris, Era, Fletcher, Justin, Marquis, Neepawa, Selkirk, and WS1812.

Sixty-one samples were received from the three Minnesota stations: Crookston, Morris, and St. Paul. Data for these samples are given in Tables 8 and 9. The samples from Morris contained some green kernels, but did not appear to have an adverse effect on results.

Sixty-six samples were received from three stations in Montana: Bozeman, Havre, and Sidney. Data for these samples are given in Tables 10 and 11.

One hundred and ten samples were received from five stations in North Dakota: Carrington, Fargo, Langdon, Minot, and Williston. The data for these samples are given in Tables 12 through 14. The samples from Carrington were grown on irrigated land.

Forty-four samples were received from two stations in South Dakota: Highmore and Watertown. The data for these samples are given in Table 15.

Twenty-two samples were received from Lind, Washington. The data for these samples are given in Table 16.

Twenty-two samples were received from Madison, Wisconsin. The data for these samples are given in Table 17. These samples were bleached but had only slightly softer milling characteristics.

Forty-four samples were received from Laramie and Sheridan, Wyoming. The data for these samples are given in Table 18.

In Table 19 are given the average results for each of the twenty-two samples submitted from seven states and 17 stations. The results for kernel characteristics and milling performance were obtained by averaging the results from the 11 tables--8 through 18. The baking results were obtained from a blend of the flours in equal proportions from each of the stations for the respective variety or selection. The regular 100 gram straight dough rich formula baking procedure was used in baking the flour



blends. The General Evaluation column includes the general overall performance of the blend of each sample. The General Evaluation given for the sample may not agree with that of the blend, since averages do not express the range and poor characteristics may be masked.

For simplicity and brevity of the report, as in previous reports, each variety will be discussed from the general overall viewpoint rather than the individual stations. The general evaluation summarizes the results from the individual stations for one crop year. The evaluation is more meaningful for the overall performance of a variety when at least two or more crop years are included and are discussed under a new category of The Prospect.

In Table 20, the averages are given by states for the three varieties of Chris, Justin and Selkirk. This table gives a comparison of the varieties by state, as well as state averages of the three varieties for comparative purposes, and the 1970 grand averages for the two varieties, Chris and Justin. The 1969 grand averages for the same two varieties are also given for comparison of the two crop years. In general, the 1970 crop had slightly poorer kernel characteristics (test weight, 1,000 kernel weight, kernel size distribution) than last year with approximately 1/2% higher protein content. The milling was somewhat poorer than last year showing a percent and one-half less in flour extraction, and 4 points higher in mineral content. The absorption was 1-1/2% less than last year. The mixing time was the same as last year, although the mixogram pattern was weaker, as were dough characteristics. The crumb color and crumb grain were the same as last year, and the loaf volume less than the 1969 crop.

The average results of the varieties, Chris, Justin, and Selkirk, for each of the individual stations, were used as a standard for the other selections from that station; therefore, a variety or selection may be rated satisfactory at two different stations, but comparison of the data may show much poorer results for one station due to adverse environmental conditions. Thus, in actuality, the sample with poor results could be rated as unsatisfactory quality wise when compared to the overall spring wheat area. The state averages in Table 20, are additional guides for the relative performance for the crop year by states.

Unlike previous years, by using the new format and employing the computer all of the named varieties also receive a general evaluation. However, in order to be brief, the varieties may be broadly classified as follows: Justin and Chris - Good Promise; Selkirk and Fletcher - Some Promise; Neepawa - Little Promise; Marquis, Era, and Bonanza - No Promise. Only those varieties in the Good Promise category could be consistently considered as acceptable to the trade both in the domestic as well as foreign markets.

MT 6723

Kernel Characteristics - Unsatisfactory to Questionable. Low 1,000 kernel weight, small percentage of large kernels, large percentage of small kernels, low protein content.



MT 6723 (Cont'd.)

Milling Performance - Questionable to Unsatisfactory. Low extraction, high ash at 65%.

Baking Evaluation - Questionable. Low absorption and weak dough.

General Evaluation - This selection would show no promise as a new variety because of definite deficiencies in kernel characteristics, milling performance and minimum bake absorption.

The Prospect - Based on two crop years' results, this selection would definitely show no promise as a new variety. It consistently shows definite deficiencies in kernel characteristics, milling performance and minimum bake absorption, as well as questionable dough characteristics.

MT 6830

Kernel Characteristics - Questionable. Low protein.

Milling Performance - Questionable to Unsatisfactory. Tendency to show softness, as well as low extraction and high flour ash at 65%.

Baking Evaluation - Questionable. Tendency towards low absorption and weak doughs.

General Evaluation - This selection would show no promise as a new variety based on this year's results, because of the low wheat protein content and poor milling characteristics, as well as a tendency towards low absorption.

MT 6834

Kernel Characteristics - Questionable to Unsatisfactory. Low 1,000 kernel weight, low percentage of large kernels, high percentage of small kernels, low protein content.

Milling Performance - Unsatisfactory. Low extraction and very high flour ash.

Baking Evaluation - Satisfactory.

General Evaluation - This selection would show little promise as a new variety because of the deficiencies in the kernel characteristics and milling performance, although the baking characteristics were satisfactory.



MT 6839

Kernel Characteristics - Questionable to Unsatisfactory. Low test weight, low percentage of large kernels, low protein content.

Milling Performance - Questionable. Low extraction, tendency for high flour ash at 65% extraction and tendency towards softness.

Baking Evaluation - Questionable. Low baking absorption, tendency for weak doughs and low loaf volume.

General Evaluation - This selection would show no promise as a new variety because of definite deficiencies in all categories.

ND 487

Kernel Characteristics - Satisfactory.

Milling Performance - Very Satisfactory.

Baking Evaluation - Satisfactory. Tendency towards long mixing time and strong dough.

General Evaluation - Based on this crop year's results, this selection would show good promise as a new variety.

ND 490

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory to Questionable. Tendency to low extraction, and high ash content.

Baking Evaluation - Satisfactory. Tendency towards minimum absorption, and strong dough.

General Evaluation - This selection would show some promise as a new variety, based on this year's results.

ND 491

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory to Questionable. Tendency towards low extraction and high mineral content at 65% extraction.

Baking Evaluation - Satisfactory to Questionable. Tendency towards low absorption and weak dough.

General Evaluation - Based on this year's crop results, this selection shows some promise as a new variety.



ND 496

Kernel Characteristics - Questionable to Satisfactory. Tendency to show erratic results, ranging from low test weight, kernel weight, and large kernels, as well as low protein.

Milling Performance - Satisfactory to Questionable. Tendency for maximum ash at 65% extraction.

Baking Evaluation - Questionable. Tendency for weak dough and low loaf volume.

General Evaluation - This selection would show little promise as a new variety, based on this year's crop results.

ND 499

Kernel Characteristics - Satisfactory. Tendency towards minimum protein.

Milling Performance - Satisfactory. Tendency for too large a spread between flour and wheat protein.

Baking Evaluation - Satisfactory. Tendency for low absorption and strong dough.

General Evaluation - Based on this year's crop results, this selection would show good promise; however, the growing conditions this year may have been favorable for the characteristic tendencies which were mentioned to be a minimum.

S6579

Kernel Characteristics - Satisfactory. Tendency for minimum test weight and protein content.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. Minimum absorption and tendency for strong doughs.

General Evaluation - Based on this crop year's results, this selection would show some promise as a new variety.

The Prospect - Based on three crop years, this sample has shown some promise for two years with minimum characteristics such as protein content and bake absorption. One year it was rated as having little promise due to erratic results obtained from the various locations. However, a combination of the three years' data show that this selection would have little promise as a new variety primarily due to the minimal wheat protein content and bake absorption.



Wisc. 271

Kernel Characteristics - Questionable. Tendency towards small kernels and minimum protein content.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. Long mixing time, low bake absorption, and strong dough.

General Evaluation - This selection would show little promise as a new variety based on this year's results.

The Prospect - This selection would show no promise as a new variety based on four crop years, primarily because of the tendency towards long mixing, strong doughs, and minimum protein content, as well as bake absorption.

Wisc. H678-1-69

Kernel Characteristics - Questionable to Satisfactory. Minimum protein content.

Milling Performance - Satisfactory. Tendency towards softness.

Baking Evaluation - Unsatisfactory to Questionable. Tendency to long mixing, strong doughs.

General Evaluation - This selection would show little promise as a new variety based on this crop year's results due to minimum deficiencies in all categories.

The Prospect - This selection would show no promise as a new variety due to the minimum protein content, minimum extraction, tendency towards soft milling characteristics, long mixing time and a tendency to too strong a dough, based on two crop years' results.

69 I 157

Kernel Characteristics - Questionable to Unsatisfactory. Low test weight, low 1,000 kernel weight, low percentage of large kernels, high percentage of small kernels, low protein content.

Milling Performance - Questionable. Low extraction and high flour ash.

Baking Evaluation - Questionable to Unsatisfactory. Low bake absorption and long mixing time.

General Evaluation - Based on this year's crop results, this selection would show no promise as a new wheat variety, being deficient in all categories.



SAWFLY YIELD NURSERY SAMPLES - 1970 CROP

Fifty-one samples were received from two stations in Montana and one station in North Dakota. Seventeen samples were received from each of the stations; Conrad and Sidney, Montana, and Williston, North Dakota. Four of these samples were the named varieties: Chinook, Fortuna, Rescue, and Thatcher. Thirteen of the samples were the selections: CN 2144, CN 530411, CN 754051, CN 754133, MT 681, MT 6812, ND 6579, ND 6662, ND 6677, ND 6723, ND 6736, ND 6763, and ND 6765. The data for these samples from the individual stations are given in Tables 21 and 22. In Table 23, are the averages for these data. This year, for each station, the varieties of Chinook, Fortuna, Rescue, and Thatcher were averaged for standard performance and results of the individual samples were compared to this average.

Also, another series of 20 sawfly samples was received from the Williston station. Four of these samples were the named varieties: Chris, Fortuna, Waldron and WS 1812, as well as a selection from Fortuna: B Fortuna. Fifteen of the samples were the selections: S681, S683, S686, S688, S6816, S6821, S6828, S6840, S6841, S6847, S6850, S6851, S6855, S6859, and S6879.

A general evaluation column in Table 22 describes the overall performance for the selections of the special series from Williston, North Dakota, as to their potential as new varieties. No discussion is included for the secondary sawfly samples since they represent one station and one crop year's data.

CN 2144

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory to Questionable. Tendency towards low extraction.

Baking Evaluation - Questionable. Minimum bake absorption.

General Evaluation - Based on this crop year's results, this selection would show little promise as a new variety due to the low absorption.

CN 530411

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable to Satisfactory. Tendency towards minimum absorption.

General Evaluation - Based on this crop year's results, this selection would show some promise as a new variety; however, it does have a tendency to give minimum absorption.



CN 530411 (Cont'd.)

The Prospect - Based on three crop year's results, this selection would show some promise as a new variety, but does definitely have a tendency to give minimum absorption. Larger samples of this selection should be tested to verify this tendency.

CN 754051

Kernel Characteristics - Satisfactory to Questionable. Tendency towards high ash.

Milling Performance - Unsatisfactory. Low extraction, high ash.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this crop year's results, this selection would show no promise as a new variety due to the low extraction and high flour ash which is the reflection of the high wheat ash.

The Prospect - Based on two crop years' results, this selection definitely shows poor milling results in both years giving low extraction and a tendency towards soft milling characteristics, it therefore would show no promise.

CN 754133

Kernel Characteristics - Satisfactory to Questionable. Tendency for high wheat mineral content.

Milling Performance - Satisfactory to Questionable. Maximum mineral content at 65% extraction.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this crop year's results, this selection would show good promise as a new variety; however, the high wheat mineral content may cause sufficient loss in extraction to make the selection undesirable in other crop years.

MT 681

Kernel Characteristics - Questionable. Low 1,000 kernel weight, small percentage of large kernels and minimum protein content.

Milling Performance - Satisfactory to Questionable. Minimum extraction.

Baking Evaluation - Questionable to Satisfactory. Minimum bake absorption.



MT 681 (Cont'd.)

General Evaluation - This selection would show some promise as a new variety based on this year's results.

MT 6812

Kernel Characteristics - Questionable to Unsatisfactory. Low kernel weight, low wheat protein content.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable to Satisfactory. Minimum bake absorption.

General Evaluation - This year's crop results show this selection to have some promise as a new variety.

The Prospect - Based on two crop years' results, this selection would show little promise as a new variety. Last year it showed deficiencies in all categories; this year it maintains deficiencies both in the kernel characteristics and the low bake absorption.

ND 6579

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory. Tendency towards soft characteristics.

Baking Evaluation - Questionable to Satisfactory. Minimum bake absorption.

General Evaluation - This selection shows some promise as a new variety this year.

The Prospect - Based on four crop years, this selection would show some promise as a new variety, but does tend to give somewhat erratic results in its milling performance showing a tendency for soft milling characteristics and minimum extraction. It has also shown a tendency for long mixing time and this year showed a minimum bake absorption.

ND 6662

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory.

ND 6662 (Cont'd.)

General Evaluation - Based on this crop year, this selection would show good promise as a new variety.

The Prospect - Based on two crop years' results, this selection would show good promise as a new variety.

ND 6677

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this crop year's results, this selection would show good promise as a new variety.

The Prospect - Based on two crop years' results, this selection would show good promise as a new variety.

ND 6723

Kernel Characteristics - Satisfactory.

Milling Performance - Unsatisfactory. Low extraction and high flour mineral content.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this year's crop results, this selection would show no promise due to the poor milling performance.

ND 6736

Kernel Characteristics - Satisfactory. Tendency towards high mineral content.

Milling Performance - Questionable to Unsatisfactory. Minimum extraction, maximum ash.

Baking Evaluation - Very Satisfactory.

General Evaluation - Based on this crop year's results, this selection would show some promise as a new variety. The baking performance is very good; unfortunately the high mineral content is also reflected in the flour ash, and it does give minimum extraction.



ND 6763

Kernel Characteristics - Satisfactory.

Milling Performance - Questionable to Unsatisfactory. Minimum extraction, maximum flour ash.

Baking Evaluation - Satisfactory.

General Evaluation - This selection, based on this crop year's results, would show some promise as a new variety, due primarily to the minimum milling performance.

ND 6765

Kernel Characteristics - Satisfactory.

Milling Performance - Questionable to Unsatisfactory. Minimum flour extraction.

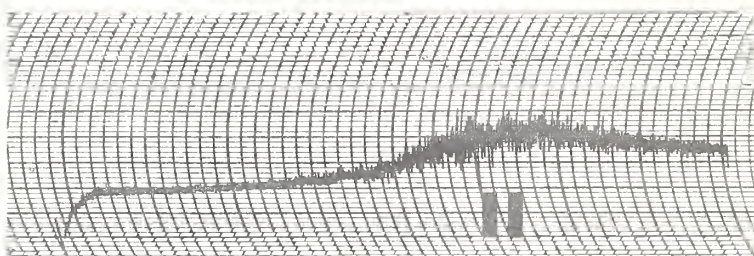
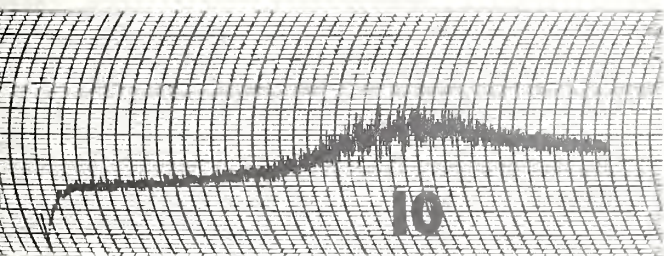
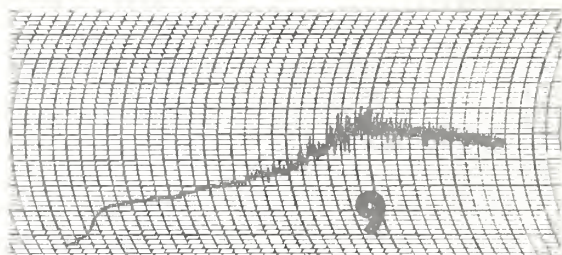
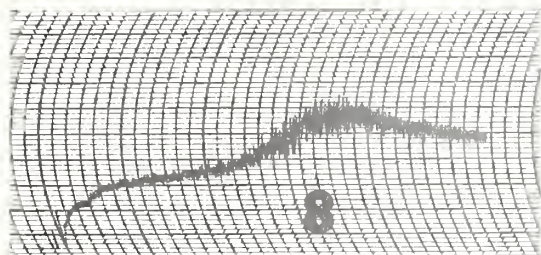
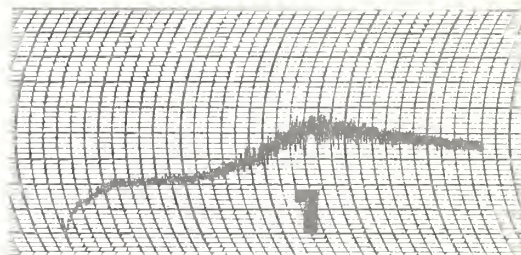
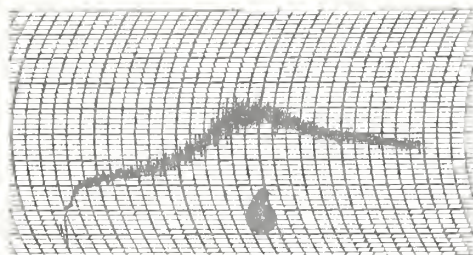
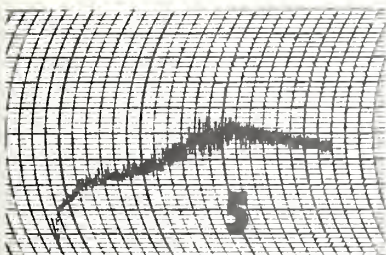
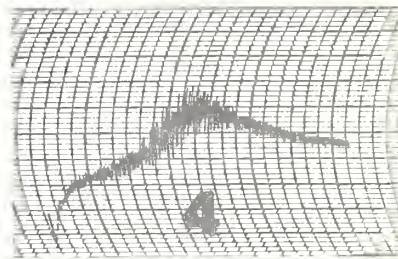
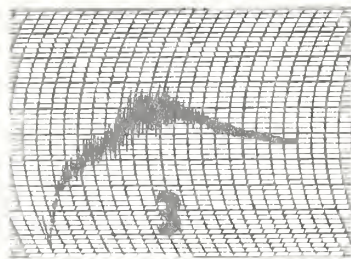
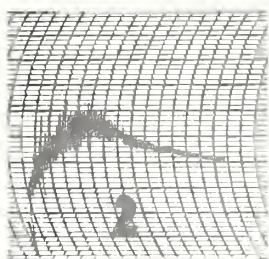
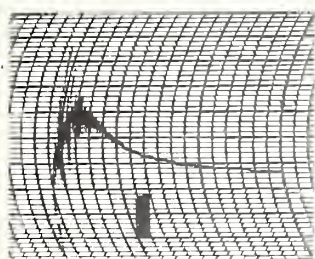
Baking Evaluation - Unsatisfactory. Undesirable dough characteristics.

General Evaluation - Based on this crop year's results, this selection shows no promise as a new variety due to the poor dough characteristics and minimum flour extraction.



REFERENCE MIXOGRAMS

HARD RED SPRING WHEAT



U.S.D.A. SPRING WHEAT QUALITY LABORATORY

FARGO, NORTH DAKOTA



TABLE 1

VARIETY OR ID. NO.	T.M.	1000 KWT.	KERNEL SIZE LG MED SM	WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	MIN. 2 65EX.	FIR. PRO.	MLG. CHAR.	MLG. PER.	MIX. ABS.	MIX. PAT.	BAKE ABS.	TIME MIN.	DOUGH CHAR.	CRUMBS COLOR	CRUMB GRAIN	LOAF BAKE VOL.	GEN. EVAL.	MAJOR DEFICIENCY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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ONYLANO - CARRINGTON, NORTH DAKOTA																						
BONANZA	62.7	30.4	22	76	2	1.57	14.6	4	65.8	0.41	13.3	2	5	61.6	7	61.0	87.99	915	6	1	M65 BA	OD LV
CHRIS	62.3	29.0	29	70	1	1.54	15.6	2	66.9	0.37	15.0	1	3	63.2	4	62.6	88.05	1010	4	3	OD	
FLETCHER	63.7	30.6	62	37	1	1.56	15.0	2	69.2	0.35	13.7	1	1	62.3	3	61.9	90.75	925	4	3	BA	MP BA
JUSTIN	60.7	28.7	26	73	1	1.64	15.5	2	68.6	0.36	14.7	1	2	64.2	5	63.3	90.50	990	4	3	OD	
MANITOU	60.5	25.7	9	90	1	1.65	15.3	4	67.9	0.37	14.6	1	2	62.8	4	61.7	87.09	990	5	3	KW BA	OD
NEEPANA	61.7	30.5	34	55	1	1.53	15.2	2	66.9	0.39	14.4	1	3	62.5	3	61.8	89.10	995	2	3	OD	
REDIVER68	63.8	34.1	29	70	1	1.49	14.6	3	68.0	0.39	13.9	1	3	66.6	8	65.3	83.07	945	8	1	MT	OD
SELKIRK	58.4	30.0	15	83	2	1.61	14.8	4	68.8	0.40	14.3	1	3	63.2	4	62.3	87.05	975	4	3	TH LG	M65 OD
THATCHER	59.8	24.2	4	92	1	1.62	15.3	8	67.9	0.39	13.5	1	3	60.7	3	59.5	85.07	980	8	1	KW SM	UP OD
MAMOUSKA	61.7	33.2	46	53	1	1.68	14.6	3	68.9	0.36	14.2	1	2	63.8	4	62.8	87.99	940	3	4	BA	OD GR
GHO1809	63.4	30.6	38	61	1	1.46	14.6	3	68.4	0.36	13.8	1	2	61.9	4	60.7	89.10	970	6	2	OD	
GHO1812	63.5	37.3	24	75	1	1.54	14.3	4	66.5	0.36	13.5	2	2	67.0	4	65.9	85.05	925	4	3	MP OD	
AB6770	63.0	39.2	64	35	1	1.52	15.0	2	66.3	0.39	14.1	2	5	67.0	5	66.5	83.05	915	5	2	EX LV	OD LV
CARGILL208	63.1	30.2	27	72	1	1.67	15.0	2	66.6	0.40	14.0	2	4	65.3	7	64.6	90.99	955	2	3	M65 MT	OD LV
DEKALB86	62.4	38.8	21	78	1	1.51	14.6	3	68.7	0.38	14.2	1	3	64.7	4	63.7	88.07	945	4	3	OD	
NO487	63.1	37.7	62	37	1	1.68	15.1	2	69.4	0.37	13.9	1	2	66.0	5	65.0	91.99	900	4	3	OD LV	
NO491	62.9	36.9	72	27	1	1.70	15.0	2	66.2	0.38	13.8	1	3	66.6	5	65.3	90.70	1040	3	3	WH OD	
NO497	62.7	36.8	70	29	1	1.68	15.0	2	67.3	0.36	13.9	1	2	67.3	7	66.4	80.07	975	3	4	OD	
S6579	60.5	38.2	48	51	1	1.64	14.5	4	68.4	0.38	14.1	1	3	66.3	6	64.8	90.90	955	3	3	MP OD	
MISC255	61.8	37.3	48	51	1	1.76	16.2	2	66.8	0.43	15.4	1	8	67.3	5	66.0	93.99	1005	3	1	WH OD	
MISC271	63.1	34.7	43	56	1	1.49	14.2	4	69.8	0.35	13.7	1	1	65.0	6	63.7	91.99	975	2	4	MP	M65
IRRIGATED - CARRINGTON, NORTH DAKOTA																						
BONANZA	63.0	31.7	30	69	1	1.66	14.7	3	67.3	0.40	13.8	1	4	64.7	5	64.1	94.99	950	4	2	LG	M65 OD
CHRIS	63.1	32.5	53	46	1	1.67	15.0	2	66.9	0.36	14.3	1	3	65.3	3	64.9	92.10	925	2	3	MP OD	
FLETCHER	63.6	30.2	53	46	1	1.56	13.1	5	68.9	0.37	11.9	1	2	62.8	3	63.1	89.99	925	8	1	BA	OD
JUSTIN	61.7	31.3	34	65	1	1.75	15.2	3	68.9	0.37	14.0	1	2	66.3	6	65.7	93.99	965	4	3	OD	
MANITOU	61.4	27.3	20	79	1	1.60	14.3	3	68.2	0.39	13.4	1	3	62.3	3	61.8	90.99	985	8	1	KW LG	
NEEPANA	64.6	41.3	78	21	1	1.72	14.7	2	67.7	0.38	13.5	1	2	65.7	3	64.8	91.70	1050	4	3	OD	
REDIVER68	64.0	32.6	35	64	1	1.66	14.5	3	68.1	0.40	13.8	1	3	67.6	7	66.7	85.99	920	4	3	M65 MT	GR
SELKIRK	59.7	32.1	44	55	1	1.79	14.0	5	69.3	0.40	13.3	1	3	64.2	4	63.2	85.99	920	4	3	TH MP	M65 BA
THATCHER	61.6	36.5	15	86	1	1.68	13.2	7	68.4	0.41	12.5	1	3	64.2	4	63.2	89.99	910	4	3	KW M65	BA
MALORIN	62.2	37.2	59	40	1	1.66	14.8	2	68.4	0.38	13.7	1	2	64.7	4	63.6	87.99	955	4	3	BA	
MAMOUSKA	61.7	31.8	52	46	2	1.66	15.0	3	67.3	0.36	13.9	1	2	64.2	4	63.2	90.99	945	4	3	SM BA	
GHO1809	62.7	29.5	34	65	1	1.57	15.2	3	67.5	0.35	13.8	1	2	64.4	5	63.3	85.09	950	5	3	BA	OD
GHO1812	64.2	37.6	63	1	1.66	13.4	5	68.0	0.35	12.1	2	2	65.7	3	65.0	83.09	905	5	3	MP OD		
AB6770	63.6	36.6	68	30	2	1.61	15.3	3	66.2	0.36	13.5	1	3	66.6	5	65.9	93.99	1030	4	3	SM OD	
CARGILL208	62.5	29.2	20	78	2	1.63	14.0	5	68.0	0.37	13.0	1	2	63.8	7	63.1	85.07	930	7	2	KW LG	SM MP BA MT OD
DEKALB86	62.4	29.5	33	66	1	1.63	14.4	3	68.1	0.35	13.5	1	2	65.7	4	65.5	83.07	925	5	3	OD	
NO487	62.2	33.9	57	42	1	1.72	14.9	2	71.3	0.32	13.4	1	1	65.0	5	64.3	88.09	900	2	4	OD	
NO491	62.9	38.3	79	20	1	1.74	15.3	2	69.7	0.35	13.8	2	3	64.7	4	63.8	86.10	1010	4	3	OD	
NO497	63.0	41.5	78	21	1	1.68	15.0	2	67.0	0.34	13.4	1	2	62.3	6	62.0	75.05	915	8	1	PD GR	
S6579	60.1	34.4	46	52	2	1.58	14.4	3	69.3	0.36	13.4	1	2	63.2	5	62.2	80.07	935	7	2	SM OD	GR
MISC255	62.6	36.2	55	45	2	1.74	15.2	3	68.1	0.41	13.7	1	3	64.2	5	63.3	93.99	990	7	2	SM M65	OD
MISC271	62.9	33.1	37	61	2	1.54	14.3	3	69.5	0.34	13.1	1	1	61.9	6	60.9	89.99	970	8	1	SM	OD BA

1/ CLEAN ORY - SUBTRACT 1 LB./80. FOR DOCKAGE-FREE T-W.

2/ 1% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

5/ REFER TO REFERENCE MICROGRAMS FOR NUMERICAL CURVE PATTERNS. 1 = VERY HEAVY, 2 = HEAVY, 3 = MODERATE, 4 = LIGHT, 5 = SLIGHTLY HEAVY, 6 = SLIGHTLY LIGHT, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.

7/ XXX.9 = VERY WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY, XXX.01 = THICK WALL OR HARSH, XXX.03 = CLOSE, XXX.05 = OPEN, XXX.06 = OPEN-SLIGHTLY IRREGULAR, XXX.07 = IRREGULAR, XXX.09 = OPEN, XXX.10 = IRREGULAR, XXX.30 = SLIGHTLY OPEN, IRREGULAR.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.



QUALITY DATA ON FIELD PLOT NURSERY SAMPLES

1970 CROP

VARIETY OR SEL. NO.	T-M. #/BU.	1000 KWT.	KERNEL SIZE LG MED SM	WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	FLR. MIN-55ER.	FLR. PRO.	MLG. CHAR.	MLG. ABS.	MIX. PAT.	BAKE ABS.	MIX. TIME	DOUGH CHAR.	COLOR	CRUMB GRAIN	LOAF BAKE VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY		
																							CC.	
DICKINSON, NORTH OKOTA																								
BONANZA	62.0	26.5	5	91	4	1.68	15.4	8	63.2	0.42	15.0	2	4	61.6	5	61.3	4.50	4	100.0	93.70	950	7	1	LG MP BA
CHRIS	61.0	30.4	42	56	2	1.86	17.2	2	65.3	0.41	16.2	1	3	65.3	3	64.6	3.50	3	102.7	90.70	995	2	4	MP BA
ERA	62.5	28.3	18	79	3	1.99	15.9	6	66.1	0.40	14.9	1	2	61.8	3	60.7	3.25	3	101.5	80.07	976	6	1	MP BA
ERA CHER	61.0	28.3	18	79	3	1.99	15.9	6	66.1	0.40	14.9	1	2	61.8	3	60.7	3.25	3	101.5	80.07	976	6	1	MP BA
FORTUNA	60.8	33.6	46	51	3	1.71	17.4	2	65.4	0.43	16.8	1	5	64.4	3	64.2	2.50	3	103.7	85.09	1050	2	3	MP BA
JUSTIN	61.7	27.2	16	81	3	1.70	16.9	3	64.3	0.40	16.1	2	3	64.2	2	63.2	2.50	4	101.7	80.05	1045	4	3	MP BA
MANITOU	60.6	26.5	14	81	5	1.77	17.2	3	64.6	0.41	16.1	2	3	64.2	2	63.2	2.25	4	101.5	80.07	1050	4	3	MP LG M65 OD
NEEPANA	61.1	27.4	8	88	4	1.80	17.2	3	61.3	0.42	16.3	2	6	65.0	2	63.8	2.00	5	100.5	75.05	955	5	1	EX M65
POLK	62.2	31.7	36	59	5	1.72	16.7	2	64.6	0.41	15.7	1	3	64.2	4	63.8	3.50	3	101.0	82.05	1035	2	4	M65
REOLIVER68	62.3	31.7	10	87	3	1.70	17.5	3	65.6	0.42	15.5	1	4	68.5	6	67.4	5.25	1	99.0	88.09	1125	8	1	LG M65 PO MT
SELKIRK	58.8	28.7	5	90	5	1.68	17.0	8	65.3	0.37	16.5	1	2	64.4	4	63.1	3.50	3	101.7	80.05	1050	2	1	TM
THATCHER	60.9	24.6	6	88	6	1.70	16.2	5	65.1	0.37	15.4	1	2	62.8	3	61.7	2.75	3	102.7	79.05	1015	4	3	KH BA
MALORON	60.8	27.4	23	73	4	1.79	17.2	2	64.7	0.36	16.3	1	2	64.2	3	63.8	2.25	4	102.7	80.05	1040	4	3	OD
MANOUSKA	60.5	30.3	40	56	4	1.73	16.6	2	66.8	0.35	15.8	1	2	65.0	3	63.9	2.75	5	102.5	75.05	990	5	3	OD
GNO1809	62.1	30.3	26	70	4	1.72	17.9	2	64.1	0.34	16.8	1	2	65.0	3	64.0	3.25	3	103.0	80.05	1100	2	4	OD
GNO1812	61.5	32.4	13	85	2	1.86	16.9	3	63.4	0.37	16.0	2	2	68.5	4	66.1	2.00	4	104.0	80.05	1125	3	4	LG MH OD
AR6770	59.8	32.9	49	49	2	1.73	17.2	2	59.5	0.41	15.5	2	8	66.3	3	65.0	2.25	7	97.2	85.03	890	8	1	M65 PO LV
CAR6770	62.2	29.8	23	73	4	1.60	16.5	2	63.3	0.37	15.6	2	1	65.0	5	63.8	3.00	3	99.5	75.07	1035	2	4	KH LG
OK6770	60.8	26.3	10	84	6	1.66	16.6	4	66.5	0.36	15.9	1	1	65.3	3	63.9	2.75	5	102.5	75.07	1035	2	4	OD
DELMAR68	61.5	33.6	38	59	3	1.84	17.0	2	66.9	0.33	16.1	1	1	66.3	4	65.2	3.00	4	100.5	88.99	1015	4	3	OD
NO491	60.7	30.9	47	49	4	1.79	17.4	2	62.7	0.36	16.1	2	3	67.0	4	65.4	2.75	5	101.0	70.05	1050	5	2	GR
NO497	60.6	35.1	53	43	4	1.82	16.9	2	64.4	0.33	15.6	2	1	68.2	6	66.9	4.00	3	102.0	80.07	1010	2	4	OD
S6579	60.2	33.4	36	58	6	1.58	16.5	2	67.1	0.33	15.9	1	1	66.3	4	65.0	3.25	3	104.7	93.99	1015	2	4	OD
S6763	59.8	33.3	39	56	5	1.69	16.8	3	62.7	0.36	16.1	3	3	65.7	3	64.4	2.00	3	102.7	88.05	985	2	4	MH M65 OD
MISC255	60.2	31.1	15	81	4	1.95	17.8	3	64.7	0.41	16.8	2	3	66.6	4	65.1	3.50	4	103.7	89.05	990	4	3	MH M65 OD
MISC271	61.4	29.2	8	86	6	1.81	17.2	3	67.5	0.33	16.2	1	1	65.7	4	64.4	3.75	4	102.7	90.99	995	4	3	OD
FARGO, NORTH OKOTA																								
BONANZA	62.8	30.4	21	77	2	1.65	14.2	5	65.7	0.39	13.2	1	2	61.9	8	61.0	5.25	4	101.8	90.99	905	2	4	LG SM
CHRIS	59.0	30.1	46	53	1	1.73	14.9	3	65.4	0.43	14.2	1	3	61.9	4	61.2	4.00	5	101.7	91.09	1000	4	3	OD
ERA	63.5	31.1	58	41	1	1.70	13.6	4	68.6	0.41	12.3	1	2	59.7	4	59.0	4.00	4	101.5	85.10	835	8	1	MP LV
FLETCHER	61.6	38.9	83	16	1	1.69	13.9	4	67.7	0.40	12.8	1	2	61.9	3	61.2	3.25	3	101.7	80.05	975	4	3	MP OD
JUSTIN	61.1	31.7	53	46	1	1.95	16.1	2	67.5	0.39	15.0	1	2	63.2	4	62.1	3.75	3	101.0	83.09	975	4	3	MH OD
MANITOU	61.4	29.2	23	76	1	1.77	15.2	3	65.8	0.41	14.3	1	3	61.3	3	60.3	3.50	4	99.0	82.09	945	4	3	KH LG BA
NEEPANA	61.5	31.4	39	60	1	1.79	14.4	2	64.4	0.42	13.3	2	4	61.3	2	60.2	3.00	4	102.5	80.07	940	5	2	BA LV
POLK	61.9	38.9	33	66	1	1.79	15.1	2	66.7	0.41	13.8	1	2	61.9	3	60.7	4.00	4	103.0	82.09	965	2	4	MP LV
REOLIVER68	64.3	37.2	42	51	1	1.72	13.6	5	68.2	0.42	13.1	1	2	62.8	4	61.6	4.25	3	100.0	85.10	870	4	3	MP OD LG
SELKIRK	60.3	34.5	34	55	1	1.81	13.6	5	68.2	0.42	13.0	1	2	62.8	4	61.6	4.25	3	100.0	85.10	870	4	3	MP OD LG
THATCHER	61.8	27.0	6	92	2	1.79	14.4	8	66.2	0.45	13.3	1	5	61.6	4	60.6	4.00	3	104.7	83.10	880	6	1	KH SM M65 BA OD
MALORON	61.7	33.9	23	76	1	1.84	15.1	3	66.1	0.44	13.5	1	4	64.4	4	63.2	4.00	3	104.5	80.05	910	4	2	LG M65 PO OD
MANOUSKA	61.9	31.8	31	83	2	1.83	15.1	3	68.7	0.40	12.9	1	2	60.7	4	59.1	5.00	3	104.0	82.09	900	7	2	MP OD
NO491	61.7	31.8	49	40	1	1.75	14.0	5	66.4	0.39	12.9	2	2	64.4	3	63.2	2.50	4	102.0	94.99	960	2	4	LG MP
GNO1812	63.7	35.3	80	1	1.75	14.0	5	66.4	0.39	12.9	2	2	64.4	3	63.2	2.50	4	102.0	94.99	960	2	4	LG MP	
AR6770	62.7	36.0	14	84	2	1.79	14.1	5	65.4	0.43	12.5	1	3	63.5	5	62.4	4.25	5	103.0	83.10	895	5	2	SM MP OD
OK6770	63.2	31.5	46	33	1	1.77	14.0	2	71.6	0.36	12.2	1	2	61.2	4	60.9	3.50	3	104.7	93.99	860	4	3	MP OD LG LV
MANITOU	62.0	31.5	46	33	1	1.77	14.0	2	71.6	0.36	12.2	1	2	61.2	4	60.9	3.50	3	104.7	93.99	860	4	3	MP OD LG LV
NO491	62.0	35.6	77	22	1	1.90	15.5	2	64.1	0.43	13.7	2	5	64.2	4	62.8	3.00	4	103.0	70.05	930	3	3	EX PO GR
NO497	62.0	37.2	70	29	1	1.75	14.9	2	66.4	0.36	13.1	1	3	62.3	5	61.2	4.50	4	102.0	70.05	860	4	3	PO GR LV
S6579	60.0	40.5	28	71	1	1.77	15.1	3	67.9	0.41	14.1	1	2	63.2	5	61.2	4.25	3	106.0	91.99	880	4	3	LG OD
MISC255	60.5	30.2	46	53	1	1.72	15.0	3	64.2	0.37	12.3	1	2	64.2	4	63.5	4.00	3	102.0	90.70	985	4	3	OD
MISC271	62.5	30.9	27	42	3	1.68	13.6	8	68.8	0.37	12.3	1	1	60.7	6	59.5	5.00	4	99.0	89.99	870	5	1	LG MP LV
1/ CLEAN ORY. = SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T-M.																								
2/ VERY SATISFACTORY. 3 = QUESTIONABLE-SATISFACTORY. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.																								

1/ CLEAN ORY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.M.

2/ 14% MOISTURE BASIS.

3/ 1 = SATISFACTORY, 2 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE MICROGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK, 2 = WEAK, 3 = PLATABLE-WEAK, 4 = WEAK-PLATABLE, 5 = PLATABLE-WEAK, 6 = PLATABLE, 7 = PLATABLE-WEAK, 8 = WEAK-PLATABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.)

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE.

7/ XXX.0 = BRIGHT WHITE, XXX.1 = WHITE, XXX.2 = SLIGHTLY CREAMY, XXX.3 = CREAMY, XXX.4 = VERY CREAMY, XXX.5 = CREAMY, XXX.6 = IRREGULAR OPEN, XXX.7 = IRREGULAR OPEN, XXX.8 = IRREGULAR OPEN, XXX.9 = OPEN, XXX.10 = SLIGHTLY OPEN, XXX.11 = SLIGHTLY OPEN, XXX.12 = SLIGHTLY OPEN, XXX.13 = SLIGHTLY OPEN, XXX.14 = SLIGHTLY OPEN, XXX.15 = SLIGHTLY OPEN, XXX.16 = SLIGHTLY OPEN, XXX.17 = SLIGHTLY OPEN, XXX.18 = SLIGHTLY OPEN, XXX.19 = SLIGHTLY OPEN, XXX.20 = SLIGHTLY OPEN, XXX.21 = SLIGHTLY OPEN, XXX.22 = SLIGHTLY OPEN, XXX.23 = SLIGHTLY OPEN, XXX.24 = SLIGHTLY OPEN, XXX.25 = SLIGHTLY OPEN, XXX.26 = SLIGHTLY OPEN, XXX.27 = SLIGHTLY OPEN, XXX.28 = SLIGHTLY OPEN, XXX.29 = SLIGHTLY OPEN, XXX.30 = SLIGHTLY OPEN, XXX.31 = SLIGHTLY OPEN, XXX.32 = SLIGHTLY OPEN, XXX.33 = SLIGHTLY OPEN, XXX.34 = SLIGHTLY OPEN, XXX.35 = SLIGHTLY OPEN, XXX.36 = SLIGHTLY OPEN, XXX.37 = SLIGHTLY OPEN, XXX.38 = SLIGHTLY OPEN, XXX.39 = SLIGHTLY OPEN, XXX.40 = SLIGHTLY OPEN, XXX.41 = SLIGHTLY OPEN, XXX.42 = SLIGHTLY OPEN, XXX.43 = SLIGHTLY OPEN, XXX.44 = SLIGHTLY OPEN, XXX.45 = SLIGHTLY OPEN, XXX.46 = SLIGHTLY OPEN, XXX.47 = SLIGHTLY OPEN, XXX.48 = SLIGHTLY OPEN, XXX.49 = SLIGHTLY OPEN, XXX.50 = SLIGHTLY OPEN, XXX.51 = SLIGHTLY OPEN, XXX.52 = SLIGHTLY OPEN, XXX.53 = SLIGHTLY OPEN, XXX.54 = SLIGHTLY OPEN, XXX.55 = SLIGHTLY OPEN, XXX.56 = SLIGHTLY OPEN, XXX.57 = SLIGHTLY OPEN, XXX.58 = SLIGHTLY OPEN, XXX.59 = SLIGHTLY OPEN, XXX.60 = SLIGHTLY OPEN, XXX.61 = SLIGHTLY OPEN, XXX.62 = SLIGHTLY OPEN, XXX.63 = SLIGHTLY OPEN, XXX.64 = SLIGHTLY OPEN, XXX.65 = SLIGHTLY OPEN, XXX.66 = SLIGHTLY OPEN, XXX.67 = SLIGHTLY OPEN, XXX.68 = SLIGHTLY OPEN, XXX.69 = SLIGHTLY OPEN, XXX.70 = SLIGHTLY OPEN, XXX.71 = SLIGHTLY OPEN, XXX.72 = SLIGHTLY OPEN, XXX.73 = SLIGHTLY OPEN, XXX.74 = SLIGHTLY OPEN, XXX.75 = SLIGHTLY OPEN, XXX.76 = SLIGHTLY OPEN, XXX.77 = SLIGHTLY OPEN, XXX.78 = SLIGHTLY OPEN, XXX.79 = SLIGHTLY OPEN, XXX.80 = SLIGHTLY OPEN, XXX.81 = SLIGHTLY OPEN, XXX.82 = SLIGHTLY OPEN, XXX.83 = SLIGHTLY OPEN, XXX.84 = SLIGHTLY OPEN, XXX.85 = SLIGHTLY OPEN, XXX.86 = SLIGHTLY OPEN, XXX.87 = SLIGHTLY OPEN, XXX.88 = SLIGHTLY OPEN, XXX.89 = SLIGHTLY OPEN, XXX.90 = SLIGHTLY OPEN, XXX.91 = SLIGHTLY OPEN, XXX

TABLE 5
QUALITY DATA ON FIELD PLOT NURSERY SAMPLES

1970 CROP

VARIETY OR SEL. NO.	T.M. #/BU.	1000 G.	KERNEL SIZE LG MED SM	WHT. MT. #	WHT. PRO. %	KERN. CHAS. #	ELR. EXT. %	FLR. MIN. #	FLR. 65EX. %	MLG. PRO. %	MLG. CHAS. %	MIX. PAT. %	MIX. PAT. %	BAKE ABS. %	TIME MIN.	ROUGH CHAS. %	CRUMB CHAS. %	CRUMB G/BU.	LOAF BAKE VOL. EVAL.	GEN. 9L	MINOR DEFICIENCY	MAJOR DEFICIENCY	
WILLISTON, NORTH DAKOTA																							
BONANZA	60.9	25.3	2	92	6	1.57	14.9	8	65.1	0.35	13.9	2	4	62.3	7	5.25	3	92.2	90.90	920	6	1	LG M65 BA
CHATHAM	62.2	26.4	9	89	2	1.65	15.6	3	65.3	0.31	14.5	1	4	62.5	4	2.50	2	101.7	80.05	950	6	2	WH EX MT COL
CHRIS	62.0	25.4	5	93	2	1.55	15.4	3	66.3	0.31	14.6	1	3	65.7	4	3.00	3	101.7	92.90	940	2	4	WH LG
ELR	62.7	29.9	34	65	1	1.59	15.6	2	64.4	0.34	13.2	1	5	62.5	4	4.00	3	101.7	85.05	920	8	1	EX
ELR	61.8	27.9	19	79	2	1.80	14.1	5	64.4	0.35	13.2	1	5	62.5	4	4.00	3	101.7	85.07	935	4	2	MP BA
FLETCHER	61.8	32	59	32	91	1.61	15.0	3	67.7	0.34	13.6	1	3	64.7	4	3.25	3	102.5	92.00	920	2	4	M65
BEORTUNA	62.5	33.1	27	71	2	1.55	15.2	2	69.6	0.29	14.2	1	1	64.2	3	2.75	2	100.5	85.05	925	4	3	OO
JUSTIN	62.2	33.8	27	72	1	1.56	15.7	2	69.4	0.31	14.3	1	2	64.3	3	2.75	3	105.6	80.09	950	2	4	OO
MANITU	60.7	28.8	18	80	2	1.58	16.1	2	68.4	0.30	13.5	1	2	63.5	4	4.00	3	99.0	88.10	950	2	4	OO
NEPAMA	61.2	25.7	5	93	2	1.61	16.0	3	66.9	0.31	14.9	1	3	62.3	3	2.50	3	103.5	80.07	950	4	3	LG BA
NEPAMA	61.3	26.4	8	90	2	1.63	15.6	3	65.6	0.31	14.5	1	3	62.3	2	2.50	3	102.5	85.07	890	2	4	M65
POLK	63.8	34.5	49	50	2	1.65	15.4	2	66.4	0.28	14.3	1	8	63.5	4	3.50	3	103.0	83.05	1015	2	1	WH
REDIVER68	62.7	28.8	3	93	4	1.58	14.6	5	67.4	0.33	14.0	1	8	64.4	8	7.25	1	102.7	87.10	895	8	1	MP BA
SELKIRK	60.3	28.2	10	87	3	1.53	14.5	4	69.5	0.35	13.6	1	4	61.0	4	3.25	3	102.0	87.09	915	4	2	MP BA
THATCHER	61.2	27.1	10	88	2	1.51	14.6	3	66.5	0.36	14.3	1	8	62.3	2	2.50	3	102.7	83.07	920	4	1	RA
WALGREN	61.9	31.2	34	65	1	1.66	15.6	2	67.8	0.36	14.5	1	8	63.5	3	3.00	3	101.7	83.07	985	8	1	WH
WAMUSKA	61.2	29.1	20	78	2	1.52	15.8	2	69.2	0.33	13.7	1	3	64.2	4	3.50	3	100.5	92.99	915	2	4	WH
GHO1809	63.1	26.0	5	92	3	1.44	14.3	6	68.7	0.33	13.4	1	8	61.0	4	4.00	4	100.0	80.05	910	7	2	LG HP OO
GHO1812	63.0	31.5	5	93	2	1.58	15.8	3	64.3	0.33	14.5	1	8	65.0	3	2.00	3	100.5	88.07	925	2	1	LG EX
AB6770	62.8	32.7	31	68	1	1.53	15.6	2	64.9	0.37	14.1	2	8	64.2	4	3.00	4	103.0	88.05	955	4	1	EX OO
CARGILL208	62.5	27.1	6	91	3	1.66	15.6	3	66.9	0.39	14.6	1	8	64.2	6	5.00	2	103.0	89.09	1020	4	1	LG WH OO
DEKALF86	62.2	27.0	7	91	2	1.59	14.7	4	70.1	0.36	14.0	1	8	61.3	4	4.00	3	102.0	88.10	900	5	1	LG
NO487	62.0	32.8	39	59	2	1.58	16.1	2	71.6	0.34	15.3	1	3	64.4	4	3.50	3	101.7	87.05	975	2	4	M65
NO491	62.5	31.6	45	53	2	1.65	15.8	2	65.8	0.39	14.2	2	8	63.5	3	3.00	4	101.0	80.05	970	2	1	WH PO
NO496	62.9	29.6	9	89	2	1.50	14.8	3	69.0	0.34	13.7	1	3	64.2	4	3.00	4	101.0	87.10	970	4	3	M65 OO
S6579	61.6	32.2	28	70	2	1.51	15.1	2	69.5	0.34	14.2	1	3	62.5	3	3.50	3	102.7	90.90	900	4	3	M65 BA
S6763	62.2	32.7	38	61	1	1.52	15.2	2	68.0	0.36	14.0	3	8	63.5	3	3.75	3	101.7	93.99	945	2	1	M65
WISC255	62.0	29.6	13	85	2	1.55	15.8	2	68.6	0.37	14.8	1	8	63.8	4	3.75	3	102.0	93.90	1015	2	1	MT
WISC271	63.0	28.6	10	88	2	1.53	14.7	3	69.9	0.33	13.5	1	2	63.2	6	5.25	3	100.5	87.07	935	4	3	M65
/ CLEAN ORY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.M. 1 1/2% MOISTURE BASIS.																							

1/ CLEAN ORY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.M.
2/ 14% MOISTURE BASIS.
3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-UNSATISFACTORY, 8 = UNSATISFACTORY.
4/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-UNSATISFACTORY, 8 = UNSATISFACTORY.
5/ REFER TO REFERENCE DIAGRAMS FOR NUMERIC PATTERNS.
6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY OEO, 30 = OEO.
7/ XXX.9 = BRIGHT WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = OULL GRAY, XXX.1 = VERY GRAY.
8/ XXX.OO = SOGGY, XXX.O1 = THICK WALL OR HARSH, XXX.O3 = CLOSE, XXX.O5 = OPEN, XXX.O6 = OPEN, SLIGHTLY IRREGULAR, XXX.O7 = IRREGULAR, OPEN, XXX.O9 = OPEN, XXX.10 = SLIGHTLY OPEN, IRREGULAR, XXX.20 = SLIGHTLY OPEN, IRREGULAR, XXX.30 = SLIGHTLY OPEN, IRREGULAR, XXX.90 = SLIGHTLY IRREGULAR, OPEN, XXX.96 = SLIGHTLY IRREGULAR, OPEN, XXX.99 = NOMINAL.
9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.



VARIETY OR SELECTION		T.W.		1000 KWT.		KERNEL SIZE		WHT.		WHT.		KERN.		EXT. CHAR.		FLR. MIN. 2		MLG.		MLG.		BAKE		MIX.		CRUMB		LOAF		BAKE		GEN.		MINOR		MAJOR								
		1/		2/		3/		4/		5/		6/		7/		8/		9/		10/		11/		12/		13/		14/		15/		16/		17/		18/								
		1/		2/		3/		4/		5/		6/		7/		8/		9/		10/		11/		12/		13/		14/		15/		16/		17/		18/								
CHRIS STO	52.0	27.0	13	85	2	1.58	14.6	3	62.5	0.26	1.6-0	2	2	61-3	3	60-8	3-50	4	100-7	92-99	940	3	4	KW	LG	DD	MM	M5	MC	MT	COL	665	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	
BRAND	61.0	31.4	59	99	2	1.89	11.6	8	53-8	0.43	9-1	6	8	55-1	7	54-9	1-75	20	90-2	10-00	660	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	665	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
BRAND	61.0	31.4	59	99	2	1.89	11.6	8	53-8	0.43	9-1	6	8	55-1	7	54-9	1-75	20	90-2	10-00	660	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	665	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
BRAND	61.0	31.4	59	99	2	1.89	11.6	8	53-8	0.43	9-1	6	8	55-1	7	54-9	1-75	20	90-2	10-00	660	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	665	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
POLK	61.5	37.7	70	281	2	1.80	12.2	6	62-4	0.46	11-0	2	8	56-3	3	55-9	5-75	20	97-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV
SELKIRK	56.3	32.5	47	51	2	1.89	12.4	6	61-5	0.45	11-3	1	8	56-3	3	56-0	4-50	6	98-2	92-99	795	8	1	TM	WM	LP	EX	RD	BA	DD	GR	LV	795	8	1</									



[illegible]



VARIETY DR SEL. NO.	T.W. 1/80.	1000 KWT.	SEEDL SIZE LG MED SM	WHT. MIN.	HT. 27	KERN. CHD.	FLR. EXT.	MIN. 3 27	FLR. MLC PRD.	MLG. 37	MIX. ABS.	MIX. PAT.	BAKE ABS.	MIX. 27	TIME MIN.	ODUGH CRUM8 CHAR.	CRUM8 VOL.	LDAF BAKE VOL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY			
CROOKSTON, MINNESOTA																								
BONANZA	62-0	25.7	3	88	9	1.70	13-2	8	57.9	0.51	12-4	2	3	59.7	7	6-25	7	97.0	88.50	160	8	1	OD	LG BA
CHRIS	62-0	25.7	3	88	9	1.70	13-2	8	57.9	0.51	12-4	2	3	59.7	7	6-25	7	97.0	88.50	160	8	1	OD	LG BA
ERAT	61-5	39.5	31	61	8	1.73	10-9	8	59.8	0.54	9-9	1	3	56.7	3	4-25	7	100.5	90.03	155	8	2	M65 OD	MP BA
FLITCHER	62-0	41.8	35	60	5	1.69	11-9	5	59.5	0.53	11-0	1	3	62.5	3	3-50	6	102.6	90.03	160	4	3	OD	MP
JUSTIN	61-5	26.2	25	68	7	1.93	14-1	2	59.3	0.50	13-4	1	2	65.0	5	4-75	4	102.7	93.07	175	3	4	OD	MP
NEEPANA	61-5	26.1	16	81	5	1.76	13-0	3	59.8	0.52	12-5	1	3	62.3	4	3-75	5	100.7	93.99	175	2	4	TM LG M65	EX
SEIKIRK	59-5	28.1	11	81	8	1.93	12-6	5	58.7	0.55	12-1	2	4	62.3	4	4-00	5	99.2	92.01	170	2	3	TM LG M65	EX
WS1812	64-0	34.7	13	84	3	1.83	12-8	2	54.9	0.49	12-2	3	8	64.7	3	3-00	4	98.2	93.70	192	3	1	SM OD	TM KW LG EX M65
MT6723	57-0	19.5	1	79	20	1.88	13-3	8	54.7	0.59	12-5	3	8	63.8	4	3-00	3	100.7	95.09	187	5	1	SM OD	EX
MT6834	60-0	26.8	16	73	11	1.88	11-9	6	54.2	0.57	11-2	3	8	61.6	3	3-75	5	101.0	96.07	183	4	1	BA	LG EX M65
MT6834	59-0	21.2	3	79	18	1.91	12-4	8	53.0	0.62	11-5	3	8	62.8	4	4-50	5	99.0	80.09	185	3	1	TM KW SM MP GR	LG EX M65
MT6839	58-5	27-0	5	84	11	1.94	11-4	8	58.4	0.58	10-3	2	8	59.7	2	3-00	4	99.4	90.03	151	8	1	TM LV	LG MP M65 BA DO
NO487	63-5	33-3	51	46	3	1.83	12-9	2	64.2	0.44	12-3	1	1	63.2	5	4-00	7	100.4	90.99	159	5	3	OD	MP
NO490	62-5	33-8	59	37	4	1.87	13-3	2	62.3	0.49	12-6	1	1	62.5	4	3-25	4	98.0	83.07	183	4	1	MP	BA
NO491	63-5	31.9	55	40	5	1.75	12-3	4	61.9	0.48	11-6	1	1	59.3	4	4-00	5	100.0	90.03	182	8	1	MP	BA DO
NO496	65-0	32.9	37	60	3	1.69	11-7	5	63.6	0.47	10-0	1	1	60.3	4	3-50	9	99.2	95.03	145	8	1	LV	MP BA DO
NO499	64-0	36.0	59	38	3	1.73	12-7	3	62.0	0.46	12-1	1	1	62.3	5	4-00	4	103.0	80.05	173	4	3	OD	BA
S657971	62-0	32.3	34	61	5	1.73	12-4	4	61.5	0.45	11-8	1	1	59.3	4	4-75	6	100.0	92.99	172	8	1	OD	MP BA
H678169	61-0	28-0	17	76	7	1.68	13-6	2	59.5	0.49	12-7	2	2	63.2	5	5-00	4	99.0	88.09	191	4	3	OD	MP BA
691157	59-0	23.1	5	88	7	2.02	12-6	6	57.7	0.58	11-9	2	8	61.3	4	4-00	7	99.0	95.99	156	6	1	TM KW MM BA DO LV	LG M65
MORRIS, MINNESOTA																								
BONANZA	61-5	26-4	6	86	8	1.73	13-0	4	60.5	0.54	12-6	1	3	60.7	9	7-50	20	98.0	90.99	165	8	1	LG MT	DO
CHRIS	62-0	27-5	11	84	5	1.75	13-3	3	60.8	0.55	12-9	1	4	60.7	5	4-50	8	101.0	92.90	168	2	3	M65	MP M65 BA
ERAT	61-5	28-0	19	74	7	1.80	11-9	8	60.7	0.57	11-5	1	5	57.8	6	6-00	8	103.6	92.99	160	8	1	LV	MP
FLITCHER	62-0	26-6	6	86	6	1.73	12-6	3	61.7	0.51	12-3	1	2	62.3	5	4-00	7	100.0	90.03	181	2	4	BA	LG MP EX
JUSTIN	59-0	24.9	17	74	9	1.88	14-1	3	61.7	0.51	13-5	1	2	62.3	5	5-00	7	105.0	99.03	181	2	4	BA	LG MP EX M65 BA DO LV
MARQUIS	58-0	22.9	3	84	13	1.93	11-8	8	56.1	0.63	10-9	2	8	56.7	6	6-00	20	102.0	93.99	146	8	1	TM KW SM MM	LG MP EX M65 BA DO LV
NEEPANA	60-5	27-2	10	84	6	1.85	14-2	3	60.5	0.55	13-4	1	4	62.5	4	4-25	7	100.0	92.99	171	2	4	M65	LG MP EX
WS1812	62-5	31-2	5	88	7	1.81	12-2	6	58.2	0.48	11-5	2	4	62.5	5	4-00	5	100.7	90.99	184	4	2	OD	LG MP M65 BA DO
MT6723	58-0	22-4	2	87	11	1.90	11-8	8	58.4	0.57	11-1	2	7	55.1	6	5-75	30	100.7	91.99	160	8	1	TM KW EX LV	MP EX
MT6830	59-0	26.7	15	78	7	1.95	11-8	8	57.0	0.57	10-9	2	8	59.7	5	5-50	7	102.7	87.99	166	5	1	MM BA	MP EX M65
MT6839	58-0	25-5	9	85	5	1.89	12-5	8	57.1	0.52	10-4	2	8	59.7	5	5-00	8	103.6	85.70	160	6	1	TM LG LV	MP EX BA
NO487	61-0	30-2	29	65	6	1.87	12-6	5	62.9	0.43	11-8	1	1	61.0	6	61.0	84.09	164	3	4	3	BA GR	MP EX M65	
NO490	61-5	29-2	46	48	6	1.89	13-1	2	59.3	0.50	12-4	2	3	60.3	5	5-25	7	101.0	82.10	180	4	3	BA GR	MP EX BA
NO491	61-5	31-3	40	44	5	1.90	12-4	2	58.9	0.49	12-6	2	3	60.7	5	5-00	20	101.7	93.03	182	8	1	EX	DD
NO494	62-0	33-8	16	77	7	1.83	12-3	5	58.7	0.51	11-7	1	3	59.0	5	5-00	7	103.0	82.10	182	8	1	GR LV	MP BA
NO499	62-0	30-9	59	38	3	1.75	12-8	4	60.3	0.45	11-9	1	2	61.0	6	61.0	95.99	173	2	4	4	MP	MP	
S6579	59-0	30-6	27	67	6	1.77	13-4	2	60.7	0.46	13-0	1	2	60.7	8	7-25	5	102.0	92.99	182	6	2	MT OD	MP BA
WISC271	62-0	28-5	13	82	5	1.70	11-6	8	60.7	0.46	11-0	1	2	58.3	9	7-50	7	101.7	92.99	163	8	1	MT LV	MP
H678169	60-0	28.7	25	66	9	1.75	11-8	8	58.9	0.45	11-3	2	3	61.3	9	8-25	5	100.0	91.99	182	6	1	EX MT OD	MP

1/ CLEAN ORY - SUBTRACT 1 LB./BU. FOR ODKAGE-FREE T.W.
2/ 1/2 MOISTURE BASIS.
3/ SATISFACTORY. 2 = SATISFACTORY. 3 = SATISFACTORY-QUESTIONABLE. 4 = QUESTIONABLE-SATISFACTORY. 5 = QUESTIONABLE. 6 = QUESTIONABLE-UNSATISFACTORY. 7 = UNSATISFACTORY-QUESTIONABLE. 8 = UNSATISFACTORY.

4/ 1 = NORMAL. 2 = VERY WEAK. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

5/ REFER TO REFERENCE MICROGRAMS FOR NUMERICAL CURVE PATTERN. 11 = VERY WEAK. 12 = ELASTIC. 13 = ELASTIC-PLIABLE. 14 = PLIABLE-ELASTIC. 15 = PLIABLE. 16 = PLIABLE-WEAK. 17 = WEAK-PLIABLE. 18 = WEAK. 19 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

6/ 1 = BUCKY. 2 = VERY ELASTIC. 3 = ELASTIC. 4 = ELASTIC-PLIABLE. 5 = PLIABLE-ELASTIC. 6 = PLIABLE. 7 = PLIABLE-WEAK. 8 = WEAK-PLIABLE. 9 = WEAK. 10 = VERY WEAK. 20 = SLIGHTLY DEAD. 30 = DEAD.

7/ XXX-9 = BRIGHT WHITE, XXX-8 = WHITE, XXX-7 = SLIGHTLY CREAMY, XXX-6 = BRIGHT CREAMY, XXX-5 = CREAMY, XXX-4 = VERY CREAMY, XXX-3 = GRAY, XXX-2 = DULL GRAY, XXX-1 = VERY GRAY.

8/ XXX-00 = SODGY, XXX-01 = WICKY, XXX-02 = OPEN, IRREGULAR, XXX-03 = OPEN, IRREGULAR, XXX-04 = OPEN, IRREGULAR, XXX-05 = OPEN, IRREGULAR, XXX-06 = OPEN, IRREGULAR, XXX-07 = IRREGULAR, XXX-08 = OPEN, IRREGULAR, XXX-09 = OPEN, IRREGULAR, XXX-10 = IRREGULAR, XXX-30 = SLIGHTLY OPEN, IRREGULAR.

9/ 1 = NO PROMISE. 2 = LITTLE PROMISE. 3 = SOME PROMISE. 4 = GOOD PROMISE.



VARIETY OR SEL. NO.	T.W.	1000 WT.	KERNEL SIZE		WMT. MIN.	WMT. PRO.	KERN. CHAR.	EXT.	FLR.	MIN-2	FLR.	MLG	MLG.	PER.	MIX.	ABS.	PAT.	MIX.	BAKE ABS.	MIX.	TIME	DOUGH	CRUMB GRAIN	CRUMB VOL.	LOAF BAKE VOL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY	
			LG	MD																									SM
ST. PAUL, MINNESOTA																													
59-5	23.3	10	81	9	1.96	17.7	2	56.8	0.54	17.3	1	2	67.0	4	3.50	3	98.0	87.05	218	4	3								
59-6	23.1	5	76	19	2.05	16.4	5	59.5	0.57	15.7	1	2	65.3	6	65.3	3	95.0	89.99	194	4	3	LG	5M	00					
59-7	22.7	12	77	11	1.97	15.5	5	56.7	0.58	15.1	2	5	66.0	6	66.0	3	95.0	89.70	205	4	2	M65	00					MP	
59-8	22.6	18	76	11	2.00	16.4	4	56.8	0.57	16.0	2	4	64.2	5	64.2	3	95.0	89.70	219	6	2	BA	00						
59-9	22.6	18	81	11	1.98	16.4	4	58.1	0.57	16.0	2	4	64.2	5	64.2	3	95.0	87.09											
59-10	23.1	5	87	8	1.94	17.3	3	60.0	0.60	17.0	1	3	64.7	3	64.7	3	95.0	85.07	200	4	3	LG	M65	BA					
59-11	23.9	7	93	10	1.97	16.7	3	62.1	0.56	16.0	1	2	64.2	4	64.2	3	95.0	90.70	195	4	1	SM	00	BA	00				
59-12	23.0	2	78	21	2.06	15.8	8	57.1	0.57	15.6	3	3	67.0	6	67.0	3	97.0	85.05	223	4	1	TM	KM	5M	MP	00			
59-13	23.0	6	77	12	1.96	16.4	7	56.7	0.56	16.0	2	4	63.2	6	63.2	3	95.0	85.09	223	8	1	TM	LG	EX	MP	BA			
59-14	21.8	6	77	17	1.90	15.2	7	56.7	0.54	14.7	2	4	63.2	6	63.2	3	95.0	85.09	223	8	1	TM	LG	EX	MP	BA			
59-15	20.1	1	78	21	1.82	15.2	8	54.2	0.57	14.4	3	8	63.5	6	63.5	3	98.0	80.09	224	8	1	TM	SM	MT	00				
59-16	20.0	4	77	19	1.96	15.2	7	56.5	0.51	14.1	3	6	63.5	7	63.5	3	100.5	85.09	205	5	3	LG	MT	00					
59-17	20.0	4	77	19	1.96	15.2	7	56.5	0.51	14.1	3	6	63.5	7	63.5	3	100.5	85.09	205	5	3	LG	MT	00					
59-18	20.0	24	70	16	2.06	17.2	2	58.1	0.62	16.5	2	6	66.0	5	66.0	4	97.0	86.09	216	2	3	WM	EX	M65					
59-19	20.0	24	70	16	2.06	17.2	2	58.1	0.62	16.5	2	6	66.0	5	66.0	4	97.0	86.09	216	2	3	WM	EX	M65					
59-20	24.0	14	75	9	2.16	17.4	2	56.9	0.61	16.6	2	6	66.6	6	66.6	4	93.0	85.07	222	2	3	WM	EX	M65					
59-21	21.1	3	71	26	2.22	17.9	6	55.6	0.70	17.2	2	4	68.8	5	68.8	3	95.2	89.01	195	8	1	TM	KM	5M	COL	LV			
59-22	21.1	3	71	26	2.22	17.9	6	55.6	0.70	17.2																			
59-23	21.1	3	71	26	2.22	17.9	6	55.6	0.70	17.2																			
59-24	26.8	15	74	11	1.93	16.5	4	60.5	0.50	16.2	1	2	64.2	7	64.2	3	100.0	95.99	212	6	2	BA	00						
59-25	23.6	2	79	19	1.93	16.0	8	60.9	0.47	15.6	1	1	64.2	10	64.2	3	100.0	89.10	207	8	1	5M	MP	BA					
/ CLEAN ORY - SUBTRACT 1 LB./BU. FOR OCKAGE-FREE T.W.																													
/ 142 MOISTURE BASIS, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE-UNSATISFACTORY, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																													
/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.																													
/ REFER TO REFERENCE MICROGRS FOR NUMERICAL CURVE PATTERNS. 11 = VERY WEAK --- 11 = VERY STRONG)																													
/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.																													
/ XXX-9 = BRIGHT WHITE, XXX-8 = WHITE, XXX-7 = SLIGHTLY GREY, XXX-6 = BRIGHT GREY, XXX-5 = GREY, XXX-4 = VERY GREY, XXX-3 = GREY, XXX-2 = VERY DARK, XXX-1 = DARK, XXX-0 = VERY DARK, XXX-09 = OPEN, XXX-10 = IRREGULAR, XXX-07 = IRREGULARLY OPEN, XXX-09 = OPEN, XXX-10 = IRREGULAR, XXX-30 = SLIGHTLY OPEN, IRREGULAR.																													
/ XXX-50 = SLIGHTLY IRREGULAR, OPEN, XXX-70 = SLIGHTLY OPEN, XXX-90 = SLIGHTLY IRREGULAR, XXX-99 = NORMAL.																													
/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.																													



1970 CROP

[illegible]



TABLE 11

QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

1970 CROP

VARIETY OR SEL. NO.	T.M. #/BU.	1000 KWT.	1000 G.	KG SM	KG MED	KG LG	HHT. 2/	HHT. 3/	KERN. CHAR.	FLR. EXT.	FLR. MIN. 2	FLR. PRO. 2	MLG. PER.	MLG. PER.	AB5. PAT.	MIX. PAT.	BAKE AB5.	MIX. TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF BAKE VOL. EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY		
							2/	3/	2/	3/	2/	3/	2/	3/	2/	3/	2/	3/	4/	5/	6/	7/	8/	9/			
STONEY, MONTANA																											
BONANZA	62.0	25.6	3	90	7	1.59	14.0	8	59.0	0.47	12.7	2	5	62.5	8	62.5	62.5	6.75	5	98.2	90.09	183	4	1	XW SM MT	LG M65	
CHRIS	63.0	25.1	6	90	4	1.51	14.4	4	60.8	0.44	13.6	1	3	62.5	5	63.5	63.5	3.75	4	103.6	97.99	188	2	4	XW LV	LG	
DEAN	64.0	29.2	14	90	3	1.45	12.5	3	52.0	0.44	12.6	2	4	60.7	3	60.7	60.7	3.50	6	103.0	90.93	162	7	2	8A LV	WP 8A	
FITCHER	65.0	32.4	49	49	2	1.46	12.8	3	52.0	0.44	12.6	2	4	60.7	3	60.7	60.7	3.50	6	103.0	90.93	162	7	2	8A LV	WP 8A	
JUSTIN	63.0	30.7	40	57	3	1.56	15.1	2	60.1	0.40	14.3	1	2	64.2	5	64.2	64.2	4.00	4	102.0	90.10	182	2	4	8A LV	WP 8A	
MAQUIS	63.5	29.8	24	74	2	1.58	13.7	3	58.2	0.45	13.0	1	5	61.9	4	61.9	61.9	3.25	5	102.0	88.09	186	4	2	M65 8A	8A	
PEEPHAR	62.0	26.2	10	87	3	1.54	14.1	3	59.0	0.45	13.7	1	4	60.3	3	60.3	60.3	3.25	5	100.7	82.99	193	8	1	XW LG M65	8A	
SHIRAZ	61.0	30.0	19	78	3	1.55	13.6	5	60.8	0.45	13.1	1	3	61.6	3	61.6	61.6	3.75	5	100.0	92.99	193	5	2	WP M65 8A	8A	
WS1812	63.5	32.4	6	92	2	1.59	14.5	3	58.4	0.41	13.7	2	3	65.3	4	65.3	65.3	3.00	4	101.7	86.05	178	2	4	XW WP M65	LG 8A	
MT6723	62.5	26.0	6	90	4	1.56	13.4	6	59.0	0.45	12.7	1	4	60.3	3	60.3	60.3	3.00	4	103.7	86.07	190	8	1	XW WP M65	8A	
MT6830	63.0	29.3	23	74	3	1.55	13.8	3	59.4	0.45	12.7	1	4	60.3	3	60.3	60.3	3.00	4	101.0	88.10	194	5	2	M65 8A	8A	
MT6834	63.0	27.0	12	85	3	1.53	13.7	4	59.8	0.47	13.2	2	7	61.3	4	61.3	61.3	4.00	4	100.0	83.05	203	5	1	LG 8A	EX M65	
MT6839	60.0	30.9	17	80	3	1.56	13.5	5	57.3	0.44	12.9	3	5	59.3	3	59.3	59.3	3.25	4	103.6	84.09	180	8	1	TH WP EX	BA M65	
NO487	63.5	35.0	45	52	3	1.59	15.0	2	62.7	0.38	14.2	1	1	62.3	4	62.3	62.3	3.50	3	102.5	94.99	190	4	3	GR	8A	
NO490	63.0	30.7	48	50	2	1.60	14.1	2	59.2	0.43	13.4	1	3	60.7	4	60.7	60.7	3.75	5	101.0	80.07	204	6	2	GR	8A	
NO491	63.0	30.4	38	59	3	1.62	14.1	2	59.4	0.45	13.4	1	4	60.3	5	60.3	60.3	4.50	5	101.0	90.99	200	8	1	M65	8A	
NO496	64.0	28.6	11	85	4	1.49	13.7	4	61.0	0.44	12.7	1	3	62.3	4	62.3	62.3	3.25	6	101.5	90.03	166	5	2	LG OD LV	8A	
NO499	64.0	35.2	57	41	2	1.51	14.0	2	60.2	0.39	13.0	1	2	63.2	4	63.2	63.2	3.50	4	100.0	80.05	191	3	4	GR	8A	
S6579	62.0	39.8	34	63	3	1.49	13.7	3	60.7	0.40	13.2	1	2	61.9	6	61.9	61.9	5.25	5	103.5	92.70	180	4	3	8A	8A	
WISC271	63.0	29.0	9	86	5	1.48	13.8	5	61.2	0.41	13.1	1	2	61.6	7	61.6	61.6	5.75	5	101.0	92.90	193	6	2	LG 8A MT	8A	
H678169	62.0	29.2	11	85	4	1.52	13.8	4	60.4	0.41	13.2	1	2	62.5	8	62.5	62.5	7.00	4	100.0	94.99	195	3	3	LG MT	M65	
691157	61.0	27.0	9	86	5	1.73	14.3	4	58.7	0.48	13.7	2	8	61.9	8	61.9	61.9	6.50	6	101.0	93.03	179	7	1	LG WM 8A MT DO	M65	
/ CLEAN ORY - SUBTRACT 1 LB./BU. FOR COCKAGE-FREE T.M.																											
/ 14% MOISTURE BASIS.																											
/ 3 = SATISFACTORY, 4 = QUESTIONABLE, 5 = QUESTIONABLE-SATISFACTORY, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																											
/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.																											
/ REFER TO REFERENCE NUMERALS FOR NUMERICAL CURVE PATTERNS. (1 = VERY WEAK --- 11 = VERY STRONG)																											
/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.																											
/ XXX-00 = BRIGHT WHITE, XXX-10 = WHITE, XXX-20 = BRIGHT, XXX-30 = BRIGHT, XXX-40 = BRIGHT, XXX-50 = BRIGHT, XXX-60 = BRIGHT, XXX-70 = BRIGHT, XXX-80 = BRIGHT, XXX-90 = BRIGHT, XXX-100 = BRIGHT, XXX-110 = BRIGHT, XXX-120 = BRIGHT, XXX-130 = BRIGHT, XXX-140 = BRIGHT, XXX-150 = BRIGHT, XXX-160 = BRIGHT, XXX-170 = BRIGHT, XXX-180 = BRIGHT, XXX-190 = BRIGHT, XXX-200 = BRIGHT, XXX-210 = BRIGHT, XXX-220 = BRIGHT, XXX-230 = BRIGHT, XXX-240 = BRIGHT, XXX-250 = BRIGHT, XXX-260 = BRIGHT, XXX-270 = BRIGHT, XXX-280 = BRIGHT, XXX-290 = BRIGHT, XXX-300 = BRIGHT, XXX-310 = BRIGHT, XXX-320 = BRIGHT, XXX-330 = BRIGHT, XXX-340 = BRIGHT, XXX-350 = BRIGHT, XXX-360 = BRIGHT, XXX-370 = BRIGHT, XXX-380 = BRIGHT, XXX-390 = BRIGHT, XXX-400 = BRIGHT, XXX-410 = BRIGHT, XXX-420 = BRIGHT, XXX-430 = BRIGHT, XXX-440 = BRIGHT, XXX-450 = BRIGHT, XXX-460 = BRIGHT, XXX-470 = BRIGHT, XXX-480 = BRIGHT, XXX-490 = BRIGHT, XXX-500 = BRIGHT, XXX-510 = BRIGHT, XXX-520 = BRIGHT, XXX-530 = BRIGHT, XXX-540 = BRIGHT, XXX-550 = BRIGHT, XXX-560 = BRIGHT, XXX-570 = BRIGHT, XXX-580 = BRIGHT, XXX-590 = BRIGHT, XXX-600 = BRIGHT, XXX-610 = BRIGHT, XXX-620 = BRIGHT, XXX-630 = BRIGHT, XXX-640 = BRIGHT, XXX-650 = BRIGHT, XXX-660 = BRIGHT, XXX-670 = BRIGHT, XXX-680 = BRIGHT, XXX-690 = BRIGHT, XXX-700 = BRIGHT, XXX-710 = BRIGHT, XXX-720 = BRIGHT, XXX-730 = BRIGHT, XXX-740 = BRIGHT, XXX-750 = BRIGHT, XXX-760 = BRIGHT, XXX-770 = BRIGHT, XXX-780 = BRIGHT, XXX-790 = BRIGHT, XXX-800 = BRIGHT, XXX-810 = BRIGHT, XXX-820 = BRIGHT, XXX-830 = BRIGHT, XXX-840 = BRIGHT, XXX-850 = BRIGHT, XXX-860 = BRIGHT, XXX-870 = BRIGHT, XXX-880 = BRIGHT, XXX-890 = BRIGHT, XXX-900 = BRIGHT, XXX-910 = BRIGHT, XXX-920 = BRIGHT, XXX-930 = BRIGHT, XXX-940 = BRIGHT, XXX-950 = BRIGHT, XXX-960 = BRIGHT, XXX-970 = BRIGHT, XXX-980 = BRIGHT, XXX-990 = BRIGHT, XXX-1000 = BRIGHT.																											
/ XXX-50 = SLIGHTLY IRREGULAR OPEN, XXX-70 = SLIGHTLY OPEN, XXX-90 = SLIGHTLY IRREGULAR, XXX-100 = SLIGHTLY IRREGULAR, XXX-110 = SLIGHTLY IRREGULAR, XXX-120 = SLIGHTLY IRREGULAR, XXX-130 = SLIGHTLY IRREGULAR, XXX-140 = SLIGHTLY IRREGULAR, XXX-150 = SLIGHTLY IRREGULAR, XXX-160 = SLIGHTLY IRREGULAR, XXX-170 = SLIGHTLY IRREGULAR, XXX-180 = SLIGHTLY IRREGULAR, XXX-190 = SLIGHTLY IRREGULAR, XXX-200 = SLIGHTLY IRREGULAR, XXX-210 = SLIGHTLY IRREGULAR, XXX-220 = SLIGHTLY IRREGULAR, XXX-230 = SLIGHTLY IRREGULAR, XXX-240 = SLIGHTLY IRREGULAR, XXX-250 = SLIGHTLY IRREGULAR, XXX-260 = SLIGHTLY IRREGULAR, XXX-270 = SLIGHTLY IRREGULAR, XXX-280 = SLIGHTLY IRREGULAR, XXX-290 = SLIGHTLY IRREGULAR, XXX-300 = SLIGHTLY IRREGULAR, XXX-310 = SLIGHTLY IRREGULAR, XXX-320 = SLIGHTLY IRREGULAR, XXX-330 = SLIGHTLY IRREGULAR, XXX-340 = SLIGHTLY IRREGULAR, XXX-350 = SLIGHTLY IRREGULAR, XXX-360 = SLIGHTLY IRREGULAR, XXX-370 = SLIGHTLY IRREGULAR, XXX-380 = SLIGHTLY IRREGULAR, XXX-390 = SLIGHTLY IRREGULAR, XXX-400 = SLIGHTLY IRREGULAR, XXX-410 = SLIGHTLY IRREGULAR, XXX-420 = SLIGHTLY IRREGULAR, XXX-430 = SLIGHTLY IRREGULAR, XXX-440 = SLIGHTLY IRREGULAR, XXX-450 = SLIGHTLY IRREGULAR, XXX-460 = SLIGHTLY IRREGULAR, XXX-470 = SLIGHTLY IRREGULAR, XXX-480 = SLIGHTLY IRREGULAR, XXX-490 = SLIGHTLY IRREGULAR, XXX-500 = SLIGHTLY IRREGULAR, XXX-510 = SLIGHTLY IRREGULAR, XXX-520 = SLIGHTLY IRREGULAR, XXX-530 = SLIGHTLY IRREGULAR, XXX-540 = SLIGHTLY IRREGULAR, XXX-550 = SLIGHTLY IRREGULAR, XXX-560 = SLIGHTLY IRREGULAR, XXX-570 = SLIGHTLY IRREGULAR, XXX-580 = SLIGHTLY IRREGULAR, XXX-590 = SLIGHTLY IRREGULAR, XXX-600 = SLIGHTLY IRREGULAR, XXX-610 = SLIGHTLY IRREGULAR, XXX-620 = SLIGHTLY IRREGULAR, XXX-630 = SLIGHTLY IRREGULAR, XXX-640 = SLIGHTLY IRREGULAR, XXX-650 = SLIGHTLY IRREGULAR, XXX-660 = SLIGHTLY IRREGULAR, XXX-670 = SLIGHTLY IRREGULAR, XXX-680 = SLIGHTLY IRREGULAR, XXX-690 = SLIGHTLY IRREGULAR, XXX-700 = SLIGHTLY IRREGULAR, XXX-710 = SLIGHTLY IRREGULAR, XXX-720 = SLIGHTLY IRREGULAR, XXX-730 = SLIGHTLY IRREGULAR, XXX-740 = SLIGHTLY IRREGULAR, XXX-750 = SLIGHTLY IRREGULAR, XXX-760 = SLIGHTLY IRREGULAR, XXX-770 = SLIGHTLY IRREGULAR, XXX-780 = SLIGHTLY IRREGULAR, XXX-790 = SLIGHTLY IRREGULAR, XXX-800 = SLIGHTLY IRREGULAR, XXX-810 = SLIGHTLY IRREGULAR, XXX-820 = SLIGHTLY IRREGULAR, XXX-830 = SLIGHTLY IRREGULAR, XXX-840 = SLIGHTLY IRREGULAR, XXX-850 = SLIGHTLY IRREGULAR, XXX-860 = SLIGHTLY IRREGULAR, XXX-870 = SLIGHTLY IRREGULAR, XXX-880 = SLIGHTLY IRREGULAR, XXX-890 = SLIGHTLY IRREGULAR, XXX-900 = SLIGHTLY IRREGULAR, XXX-910 = SLIGHTLY IRREGULAR, XXX-920 = SLIGHTLY IRREGULAR, XXX-930 = SLIGHTLY IRREGULAR, XXX-940 = SLIGHTLY IRREGULAR, XXX-950 = SLIGHTLY IRREGULAR, XXX-960 = SLIGHTLY IRREGULAR, XXX-970 = SLIGHTLY IRREGULAR, XXX-980 = SLIGHTLY IRREGULAR, XXX-990 = SLIGHTLY IRREGULAR, XXX-1000 = SLIGHTLY IRREGULAR.																											
/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.																											

1/ 'CLEAN ORY' - SUBTRACT 1 LB./BU. FOR OCKAGE-FREE T.M.
 2/ 'CLEAN ORY' - SUBTRACT 1 LB./BU. FOR OCKAGE-FREE T.M.
 3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = QUESTIONABLE, 4 = QUESTIONABLE-QUESTIONABLE, 5 = QUESTIONABLE-UNSATISFACTORY, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE NITROGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK, 11 = VERY STRONG)

6/ XXX-00 = VERY ELASTIC, 1 = ELASTIC, 2 = ELASTIC-ELASTIC, 3 = ELASTIC-ELASTIC, 4 = ELASTIC-ELASTIC, 5 = ELASTIC-ELASTIC, 6 = ELASTIC-ELASTIC, 7 = ELASTIC-ELASTIC, 8 = ELASTIC-ELASTIC, 9 = ELASTIC-ELASTIC, 10 = ELASTIC-ELASTIC, 11 = ELASTIC-ELASTIC.

7/ XXX-00 = VERY ELASTIC, 1 = ELASTIC, 2 = ELASTIC-ELASTIC, 3 = ELASTIC-ELASTIC, 4 = ELASTIC-ELASTIC, 5 = ELASTIC-ELASTIC, 6 = ELASTIC-ELASTIC, 7 = ELASTIC-ELASTIC, 8 = ELASTIC-ELASTIC, 9 = ELASTIC-ELASTIC, 10 = ELASTIC-ELASTIC, 11 = ELASTIC-ELASTIC.

8/ XXX-00 = SUGGY, XXX-01 = THICK WALL OR HARSH, XXX-02 = CLOSE, XXX-03 = CLOSE, XXX-04 = CLOSE, XXX-05 = OPEN, XXX-06 = OPEN, XXX-07 = OPEN, XXX-08 = OPEN, XXX-09 = OPEN, XXX-10 = OPEN, XXX-11 = OPEN, XXX-12 = OPEN, XXX-13 = OPEN, XXX-14 = OPEN, XXX-15 = OPEN, XXX-16 = OPEN, XXX-17 = OPEN, XXX-18 = OPEN, XXX-19 = OPEN, XXX-20 = OPEN, XXX-21 = OPEN, XXX-22 = OPEN, XXX-23 = OPEN, XXX-24 = OPEN, XXX-25 = OPEN, XXX-26 = OPEN, XXX-27 = OPEN, XXX-28 = OPEN, XXX-29 = OPEN, XXX-30 = OPEN, XXX-31 = OPEN, XXX-32 = OPEN, XXX-33 = OPEN, XXX-34 = OPEN, XXX-35 = OPEN, XXX-36 = OPEN, XXX-37 = OPEN, XXX-38 = OPEN, XXX-39 = OPEN, XXX-40 = OPEN, XXX-41 = OPEN, XXX-42 = OPEN, XXX-43 = OPEN, XXX-44 = OPEN, XXX-45 = OPEN, XXX-46 = OPEN, XXX-47 = OPEN, XXX-48 = OPEN, XXX-49 = OPEN, XXX-50 = OPEN, XXX-51 = OPEN, XXX-52 = OPEN, XXX-53 = OPEN, XXX-54 = OPEN, XXX-55 = OPEN, XXX-56 = OPEN, XXX-57 = OPEN, XXX-58 = OPEN, XXX-59 = OPEN, XXX-60 = OPEN, XXX-61 = OPEN, XXX-62 = OPEN, XXX-63 = OPEN, XXX-64 = OPEN, XXX-65 = OPEN, XXX-66 = OPEN, XXX-67 = OPEN, XXX-68 = OPEN, XXX-69 = OPEN, XXX-70 = OPEN, XXX-71 = OPEN, XXX-72 = OPEN, XXX-73 = OPEN, XXX-74 = OPEN, XXX-75 = OPEN, XXX-76 = OPEN, XXX-77 = OPEN, XXX-78 = OPEN, XXX-79 = OPEN, XXX-80 = OPEN, XXX-81 = OPEN, XXX-82 = OPEN, XXX-83 = OPEN, XXX-84 = OPEN, XXX-85 = OPEN, XXX-86 = OPEN, XXX-87 = OPEN, XXX-88 = OPEN, XXX-89 = OPEN, XXX-90 = OPEN, XXX-91 = OPEN, XXX-92 = OPEN, XXX-93 = OPEN, XXX-94 = OPEN, XXX-95 = OPEN, XXX-96 = OPEN, XXX-97 = OPEN, XXX-98 = OPEN, XXX-99 = OPEN, XXX-100 = OPEN, XXX-101 = OPEN, XXX-102 = OPEN, XXX-103 = OPEN, XXX-104 = OPEN, XXX-105 = OPEN, XXX-106 = OPEN, XXX-107 = OPEN, XXX-108 = OPEN, XXX-109 = OPEN, XXX-110 = OPEN, XXX-111 = OPEN, XXX-112 = OPEN, XXX-113 = OPEN, XXX-114 = OPEN, XXX-115 = OPEN, XXX-116 = OPEN, XXX-117 = OPEN, XXX-118 = OPEN, XXX-119 = OPEN, XXX-120 = OPEN, XXX-121 = OPEN, XXX-122 = OPEN, XXX-123 = OPEN, XXX-124 = OPEN, XXX-125 = OPEN, XXX-126 = OPEN, XXX-127 = OPEN, XXX-128 = OPEN, XXX-129 = OPEN, XXX-130 = OPEN, XXX-131 = OPEN, XXX-132 = OPEN, XXX-133 = OPEN, XXX-134 = OPEN, XXX-135 = OPEN, XXX-136 = OPEN, XXX-137 = OPEN, XXX-138 = OPEN, XXX-139 = OPEN, XXX-140 = OPEN, XXX-141 = OPEN, XXX-142 = OPEN, XXX-143 = OPEN, XXX-144 = OPEN, XXX-145 = OPEN, XXX-146 = OPEN, XXX-147 = OPEN, XXX-148 = OPEN, XXX-149 = OPEN, XXX-150 = OPEN, XXX-151 = OPEN, XXX-152 = OPEN, XXX-153 = OPEN, XXX-154 = OPEN, XXX-155 = OPEN, XXX-156 = OPEN, XXX-157 = OPEN, XXX-158 = OPEN, XXX-159 = OPEN, XXX-160 = OPEN, XXX-161 = OPEN, XXX-162 = OPEN, XXX-163 = OPEN, XXX-164 = OPEN, XXX-165 = OPEN, XXX-166 = OPEN, XXX-167 = OPEN, XXX-168 = OPEN, XXX-169 = OPEN, XXX-170 = OPEN, XXX-171 = OPEN, XXX-172 = OPEN, XXX-173 = OPEN, XXX-174 = OPEN, XXX-175 = OPEN, XXX-176 = OPEN, XXX-177 = OPEN, XXX-178 = OPEN, XXX-179 = OPEN, XXX-180 = OPEN, XXX-181 = OPEN, XXX-182 = OPEN, XXX-183 = OPEN, XXX-184 = OPEN, XXX-185 = OPEN, XXX-186 = OPEN, XXX-187 = OPEN, XXX-188 = OPEN, XXX-189 = OPEN, XXX-190 = OPEN, XXX-191 = OPEN, XXX-192 = OPEN, XXX-193 = OPEN, XXX-194 = OPEN, XXX-195 = OPEN, XXX-196 = OPEN, XXX-197 = OPEN, XXX-198 = OPEN, XXX-199 = OPEN, XXX-200 = OPEN, XXX-201 = OPEN, XXX-202 = OPEN, XXX-203 = OPEN, XXX-204 = OPEN, XXX-205 = OPEN, XXX-206 = OPEN, XXX-207 = OPEN, XXX-208 = OPEN, XXX-209 = OPEN, XXX-210 = OPEN, XXX-211 = OPEN, XXX-212 = OPEN, XXX-213 = OPEN, XXX-214 = OPEN, XXX-215 = OPEN, XXX-216 = OPEN, XXX-217 = OPEN, XXX-218 = OPEN, XXX-219 = OPEN, XXX-220 = OPEN, XXX-221 = OPEN, XXX-222 = OPEN, XXX-223 = OPEN, XXX-224 = OPEN, XXX-225 = OPEN, XXX-226 = OPEN, XXX-227 = OPEN, XXX-228 = OPEN, XXX-229 = OPEN, XXX-230 = OPEN, XXX-231 = OPEN, XXX-232 = OPEN, XXX-233 = OPEN, XXX-234 = OPEN, XXX-235 = OPEN, XXX-236 = OPEN, XXX-237 = OPEN, XXX-238 = OPEN, XXX-239 = OPEN, XXX-240 = OPEN, XXX-241 = OPEN, XXX-242 = OPEN, XXX-243 = OPEN, XXX-244 = OPEN, XXX-245 = OPEN, XXX-246 = OPEN, XXX-247 = OPEN, XXX-248 = OPEN, XXX-249 = OPEN, XXX-250 = OPEN, XXX-251 = OPEN, XXX-252 = OPEN, XXX-253 = OPEN, XXX-254 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XXX-317 = OPEN, XXX-318 = OPEN, XXX-319 = OPEN, XXX-320 = OPEN, XXX-321 = OPEN, XXX-322 = OPEN, XXX-323 = OPEN, XXX-324 = OPEN, XXX-325 = OPEN, XXX-326 = OPEN, XXX-327 = OPEN, XXX-328 = OPEN, XXX-329 = OPEN, XXX-330 = OPEN, XXX-331 = OPEN, XXX-332 = OPEN, XXX-333 = OPEN, XXX-334 = OPEN, XXX-335 = OPEN, XXX-336 = OPEN, XXX-337 = OPEN, XXX-338 = OPEN, XXX-339 = OPEN, XXX-340 = OPEN, XXX-341 = OPEN, XXX-342 = OPEN, XXX-343 = OPEN, XXX-344 = OPEN, XXX-345 = OPEN, XXX-346 = OPEN, XXX-347 = OPEN, XXX-348 = OPEN, XXX-349 = OPEN, XXX-350 = OPEN, XXX-351 = OPEN, XXX-352 = OPEN, XXX-353 = OPEN, XXX-354 = OPEN, XXX-355 = OPEN, XXX-356 = OPEN, XXX-357 = OPEN, XXX-358 = OPEN, XXX-359 = OPEN, XXX-360 = OPEN, XXX-361 = OPEN, XXX-362 = OPEN, XXX-363 = OPEN, XXX-364 = OPEN, XXX-365 = OPEN, XXX-366 = OPEN, XXX-367 = OPEN, XXX-368 = OPEN, XXX-369 = OPEN, XXX-370 = OPEN, XXX-371 = OPEN, XXX-372 = OPEN, XXX-373 = OPEN, XXX-374 = OPEN, XXX-375 = OPEN, XXX-376 = OPEN, XXX-377 = OPEN, XXX-378 = OPEN, XXX-379 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XXX-442 = OPEN, XXX-443 = OPEN, XXX-444 = OPEN, XXX-445 = OPEN, XXX-446 = OPEN, XXX-447 = OPEN, XXX-448 = OPEN, XXX-449 = OPEN, XXX-450 = OPEN, XXX-451 = OPEN, XXX-452 = OPEN, XXX-453 = OPEN, XXX-454 = OPEN, XXX-455 = OPEN, XXX-456 = OPEN, XXX-457 = OPEN, XXX-458 = OPEN, XXX-459 = OPEN, XXX-460 = OPEN, XXX-461 = OPEN, XXX-462 = OPEN, XXX-463 = OPEN, XXX-464 = OPEN, XXX-465 = OPEN, XXX-466 = OPEN, XXX-467 = OPEN, XXX-468 = OPEN, XXX-469 = OPEN, XXX-470 = OPEN, XXX-471 = OPEN, XXX-472 = OPEN, XXX-473 = OPEN, XXX-474 = OPEN, XXX-475 = OPEN, XXX-476 = OPEN, XXX-477 = OPEN, XXX-478 = OPEN, XXX-479 = OPEN, XXX-480 = OPEN, XXX-481 = OPEN, XXX-482 = OPEN, XXX-483 = OPEN, XXX-484 = OPEN, XXX-485 = OPEN, XXX-486 = OPEN, XXX-487 = OPEN, XXX-488 = OPEN, XXX-489 = OPEN, XXX-490 = OPEN, XXX-491 = OPEN, XXX-492 = OPEN, XXX-493 = OPEN, XXX-494 = OPEN, XXX-495 = OPEN, XXX-496 = OPEN, XXX-497 = OPEN, XXX-498 = OPEN, XXX-499 = OPEN, XXX-500 = OPEN, XXX-501 = OPEN, XXX-502 = OPEN, XXX-503 = OPEN, XXX-504 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XXX-567 = OPEN, XXX-568 = OPEN, XXX-569 = OPEN, XXX-570 = OPEN, XXX-571 = OPEN, XXX-572 = OPEN, XXX-573 = OPEN, XXX-574 = OPEN, XXX-575 = OPEN, XXX-576 = OPEN, XXX-577 = OPEN, XXX-578 = OPEN, XXX-579 = OPEN, XXX-580 = OPEN, XXX-581 = OPEN, XXX-582 = OPEN, XXX-583 = OPEN, XXX-584 = OPEN, XXX-585 = OPEN, XXX-586 = OPEN, XXX-587 = OPEN, XXX-588 = OPEN, XXX-589 = OPEN, XXX-590 = OPEN, XXX-591 = OPEN, XXX-592 = OPEN, XXX-593 = OPEN, XXX-594 = OPEN, XXX-595 = OPEN, XXX-596 = OPEN, XXX-597 = OPEN, XXX-598 = OPEN, XXX-599 = OPEN, XXX-600 = OPEN, XXX-601 = OPEN, XXX-602 = OPEN, XXX-603 = OPEN, XXX-604 = OPEN, XXX-605 = OPEN, XXX-606 = OPEN, XXX-607 = OPEN, XXX-608 = OPEN, XXX-609 = OPEN, XXX-610 = OPEN, XXX-611 = OPEN, XXX-612 = OPEN, XXX-613 = OPEN, XXX-614 = OPEN, XXX-615 = OPEN, XXX-616 = OPEN, XXX-617 = OPEN, XXX-618 = OPEN, XXX-619 = OPEN, XXX-620 = OPEN, XXX-621 = OPEN, XXX-622 = OPEN, XXX-623 = OPEN, XXX-624 = OPEN, XXX-625 = OPEN, XXX-626 = OPEN, XXX-627 = OPEN, XXX-628 = OPEN, XXX-629 = OPEN, XXX-630 = OPEN, XXX-631 = OPEN, XXX-632 = OPEN, XXX-633 = OPEN, XXX-634 = OPEN, XXX-635 = OPEN, XXX-636 = OPEN, XXX-637 = OPEN, XXX-638 = OPEN, XXX-639 = OPEN, XXX-640 = OPEN, XXX-641 = OPEN, XXX-642 = OPEN, XXX-643 = OPEN, XXX-644 = OPEN, XXX-645 = OPEN, XXX-646 = OPEN, XXX-647 = OPEN, XXX-648 = OPEN, XXX-649 = OPEN, XXX-650 = OPEN, XXX-651 = OPEN, XXX-652 = OPEN, XXX-653 = OPEN, XXX-654 = OPEN, XXX-655 = OPEN, XXX-656 = OPEN, XXX-657 = OPEN, XXX-658 = OPEN, XXX-659 = OPEN, XXX-660 = OPEN, XXX-661 = OPEN, XXX-662 = OPEN, XXX-663 = OPEN, XXX-664 = OPEN, XXX-665 = OPEN, XXX-666 = OPEN, XXX-667 = OPEN, XXX-668 = OPEN, XXX-669 = OPEN, XXX-670 = OPEN, XXX-671 = OPEN, XXX-672 = OPEN, XXX-673 = OPEN, XXX-674 = OPEN, XXX-675 = OPEN, XXX-676 = OPEN, XXX-677 = OPEN, XXX-678 = OPEN, XXX-679 = OPEN, XXX-680 = OPEN, XXX-681 = OPEN, XXX-682 = OPEN, XXX-683 = OPEN, XXX-684 = OPEN, XXX-685 = OPEN, XXX-686 = OPEN, XXX-687 = OPEN, XXX-688 = OPEN, XXX-689 = OPEN, XXX-690 = OPEN, XXX-691 = OPEN, XXX-692 = OPEN, XXX-693 = OPEN, XXX-694 = OPEN, XXX-695 = OPEN, XXX-696 = OPEN, XXX-697 = OPEN, XXX-698 = OPEN, XXX-699 = OPEN, XXX-700 = OPEN, XXX-701 = OPEN, XXX-702 = OPEN, XXX-703 = OPEN, XXX-704 = OPEN, XXX-705 = OPEN, XXX-706 = OPEN, XXX-707 = OPEN, XXX-708 = OPEN, XXX-709 = OPEN, XXX-710 = OPEN, XXX-711 = OPEN, XXX-712 = OPEN, XXX-713 = OPEN, XXX-714 = OPEN, XXX-715 = OPEN, XXX-716 = OPEN, XXX-717 = OPEN, XXX-718 = OPEN, XXX-719 = OPEN, XXX-720 = OPEN, XXX-721 = OPEN, XXX-722 = OPEN, XXX-723 = OPEN, XXX-724 = OPEN, XXX-725 = OPEN, XXX-726 = OPEN, XXX-727 = OPEN, XXX-728 = OPEN, XXX-729 = OPEN, XXX-730 = OPEN, XXX-731 = OPEN, XXX-732 = OPEN, XXX-733 = OPEN, XXX-734 = OPEN, XXX-735 = OPEN, XXX-736 = OPEN, XXX-737 = OPEN, XXX-738 = OPEN, XXX-739 = OPEN, XXX-740 = OPEN, XXX-741 = OPEN, XXX-742 = OPEN, XXX-743 = OPEN, XXX-744 = OPEN, XXX-745 = OPEN, XXX-746 = OPEN, XXX-747 = OPEN, XXX-748 = OPEN, XXX-749 = OPEN, XXX-750 = OPEN, XXX-751 = OPEN, XXX-752 = OPEN, XXX-753 = OPEN, XXX-754 = OPEN, XXX-755 = OPEN, XXX-756 = OPEN, XXX-757 = OPEN, XXX-758 = OPEN, XXX-759 = OPEN, XXX-760 = OPEN, XXX-



QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

[illegible]



QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

1970 CROP

VARIETY OR SEL. NO.	T-W #/BU.	1000 KWT.	KERNEL SIZE		WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	MIN. 2 FLR.	FLR. PRO.	M.G. CHAR.	M.G. PRO.	MIX. ABS.	MIX. PAT.	BAKE ABS.	TIME CHAR.	DOUGH CRUMBS COLOR	CRUMBS GRAIN	LOAF BAKE GEN. VOL. EVAL.	MINOR DEFICIENCY								MAJOR DEFICIENCY				
			LG	MD																SH	2/	3/	4/	5/	6/	7/	8/	9/	10/	11/	12/	13/
WILLISTON, NORTH DAKOTA																																
BONANZA	62-0	24-4	1	94	5	1-43	15-0	8	57-0	0-47	14-3	2	8	61-9	8	7-00	5	96-0	87-01	178	8	1	KW	EX	8A	MT	OO	COL	LV	LG	M65	
CHRIS	62-0	25-0	2	96	2	1-48	15-8	8	59-2	0-42	15-5	1	3	64-2	5	3-75	3	102-0	88-07	182	4	1	KW	OO							LG	
ERA	65-0	31-7	33	65	2	1-48	15-0	3	62-6	0-43	14-2	1	3	62-8	5	4-00	4	104-0	90-99	187	2	4	M65									LG
FLETCHER	62-5	32-1	37	61	2	1-60	15-2	2	59-6	0-42	15-3	2	3	64-2	5	4-00	3	101-0	91-99	187	4	3	WM	OO								
JUSTIN	62-5	28-7	18	79	3	1-54	16-4	2	60-1	0-40	16-1	1	2	64-2	6	4-50	3	101-0	91-99	195	4	3	OO									
MARQUIS	62-0	28-0	7	89	4	1-47	15-0	4	59-8	0-43	14-4	1	3	62-5	4	3-25	4	100-0	91-99	194	2	4	M65									
NEEPHAW	61-5	26-0	6	89	5	1-42	15-5	3	59-3	0-40	15-3	1	3	62-5	3	3-00	3	100-7	95-07	206	4	3	LG	OO								
NEPARK	61-5	26-0	6	89	5	1-42	15-0	4	61-7	0-41	14-4	1	2	61-6	4	61-6	3	100-0	91-99	191	6	2	8A	OO								
WELKIN	63-0	30-4	21	76	3	1-48	15-7	2	57-3	0-42	15-2	2	5	62-5	4	3-50	3	102-0	90-99	194	3	2	EX	OO								
W16723	62-5	27-0	4	93	3	1-49	15-2	3	57-4	0-42	14-9	2	5	62-5	4	3-00	3	100-0	85-09	210	4	2	LG	EX	OO							
W16830	63-0	30-4	21	76	3	1-48	15-7	2	57-3	0-42	15-2	2	5	63-2	3	3-00	3	100-0	83-09	209	4	2	EX	OO								
W16834	62-0	35-1	11	86	3	1-48	15-0	4	56-1	0-47	14-3	2	8	62-5	3	3-75	4	101-0	80-05	218	2	1	LG	GR								
W1687	60-0	32-3	31	89	3	1-50	15-3	2	60-6	0-43	15-3	2	3	63-2	4	4-00	3	101-7	82-07	193	4	3	TM	M65	OO							
W1690	62-5	30-8	35	62	3	1-48	15-2	2	59-3	0-42	14-6	1	3	62-5	5	4-25	4	101-0	81-05	221	2	4										
W1691	62-5	30-6	37	61	2	1-52	15-3	2	59-1	0-42	14-5	2	3	63-2	6	4-50	4	100-0	80-07	210	3	3	GR									
W1694	62-5	27-5	7	88	2	1-55	15-4	3	58-7	0-47	14-9	2	8	64-2	4	3-50	6	99-0	80-03	116	8	1	LV									
W1699	63-0	32-2	45	53	2	1-45	15-3	2	60-0	0-40	14-9	1	2	63-2	5	4-00	3	100-0	80-07	225	4	3	OO	GR								
W1679	61-0	31-4	15	82	3	1-32	15-3	2	59-2	0-40	15-1	2	3	62-8	6	5-50	3	102-7	81-09	205	4	3	OO									
W15C271	62-5	27-2	5	90	5	1-32	15-0	4	61-2	0-39	14-5	1	2	62-3	8	7-00	3	102-7	90-99	207	7	2	LG	8A	MT	OO						
W167169	63-0	27-9	9	87	4	1-34	14-8	4	59-1	0-41	14-3	2	3	64-2	9	9-50	3	100-1	88-07	231	8	1	WP	OO								
691157	60-5	24-4	3	93	4	1-56	15-6	4	57-4	0-45	14-9	2	7	62-8	10	8-75	3	99-0	85-10	200	8	1	KW	EX	OO							
/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR OCKAGE-FREE T.W.																																
/ 1% MOISTURE BASIS.																																
/ 1% CRACKS.																																
/ 1% NORMAL - 2 = SATISFACTORY.																																
/ 1% NORMAL - 3 = SOFT-NORMAL.																																
/ 1% NORMAL - 4 = SOFT.																																
/ 1% NORMAL - 5 = GRITTY.																																
/ 1% NORMAL - 6 = VERY MEAN.																																
/ 1% NORMAL - 7 = VERY MEAN - (1 = VERY STRONG)																																
/ 1% REFER TO REFERENCE NUMERALS FOR NUMERICAL CURVE PATTERNS.																																
/ 1% 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = MEAN-PLIABLE, 9 = MEAN, 10 = VERY MEAN, 20 = SLIGHTLY DEAD, 30 = DEAD.																																
/ 1% XXX-9 = BRIGHT WHITE, XXX-8 = WHITE, XXX-7 = SLIGHTLY CREAMY, XXX-6 = BRIGHT CREAMY, XXX-5 = CREAMY, XXX-4 = VERY CREAMY, XXX-3 = GRAY, XXX-2 = DULL GRAY, XXX-1 = VERY GRAY.																																
/ 1% XXX-0 = SLIGHTLY IRREGULAR-OPEN, XXX-70 = SLIGHTLY IRREGULAR, XXX-80 = SLIGHTLY IRREGULAR, XXX-90 = SLIGHTLY IRREGULAR, XXX-99 = NORMAL.																																
/ 1% 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.																																

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR COCKAGE-FREE T-W.

2/ 1 = VERY STRONG, 2 = SATISFACTORY, 3 = SATISFACTORY, 4 = QUESTIONABLE, 5 = QUESTIONABLE, 6 = QUESTIONABLE, 7 = UNSATISFACTORY, 8 = UNSATISFACTORY.

3/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY WEAK, 7 = VERY WEAK, 8 = VERY WEAK, 9 = VERY WEAK.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY WEAK, 7 = VERY WEAK, 8 = VERY WEAK, 9 = VERY WEAK.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERN. (1 = VERY WEAK, 2 = PLIABLE, 3 = PLIABLE, 4 = PLIABLE, 5 = PLIABLE, 6 = PLIABLE, 7 = PLIABLE, 8 = PLIABLE, 9 = PLIABLE, 10 = PLIABLE, 11 = PLIABLE, 12 = PLIABLE, 13 = PLIABLE, 14 = PLIABLE, 15 = PLIABLE, 16 = PLIABLE, 17 = PLIABLE, 18 = PLIABLE, 19 = PLIABLE, 20 = PLIABLE, 21 = PLIABLE, 22 = PLIABLE, 23 = PLIABLE, 24 = PLIABLE, 25 = PLIABLE, 26 = PLIABLE, 27 = PLIABLE, 28 = PLIABLE, 29 = PLIABLE, 30 = PLIABLE, 31 = PLIABLE, 32 = PLIABLE, 33 = PLIABLE, 34 = PLIABLE, 35 = PLIABLE, 36 = PLIABLE, 37 = PLIABLE, 38 = PLIABLE, 39 = PLIABLE, 40 = PLIABLE, 41 = PLIABLE, 42 = PLIABLE, 43 = PLIABLE, 44 = PLIABLE, 45 = PLIABLE, 46 = PLIABLE, 47 = PLIABLE, 48 = PLIABLE, 49 = PLIABLE, 50 = PLIABLE, 51 = PLIABLE, 52 = PLIABLE, 53 = PLIABLE, 54 = PLIABLE, 55 = PLIABLE, 56 = PLIABLE, 57 = PLIABLE, 58 = PLIABLE, 59 = PLIABLE, 60 = PLIABLE, 61 = PLIABLE, 62 = PLIABLE, 63 = PLIABLE, 64 = PLIABLE, 65 = PLIABLE, 66 = PLIABLE, 67 = PLIABLE, 68 = PLIABLE, 69 = PLIABLE, 70 = PLIABLE, 71 = PLIABLE, 72 = 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TABLE 15

QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

1970 CROP

VARIETY OR SEL. NO.		T.W. #/BU.	1000 G.	KERNEL SIZE LG MED SM	MIN. 27/30	WHT. PRO.	KERN. 27/30	FLR. EXT.	FLR. MIN-27/30	FLR. PRO.	MLG. 30/37	MIX. 27/30	MIX. 27/30	BAKE 27/30	ABS. 27/30	MIN. 67/11	DOUGH CRUMB TIME	CRUMB CHW.	CRUMB GRAIN	VOL. EVAL. CC.	GEN. 30/37	MINOR DEFICIENCY	MAJOR DEFICIENCY
HIGHMORE, SOUTH OKLAHOTA																							
BONANZA	56.0	18.9	0	73	27	1.89	17.2	8	55.4	0.61	16.7	2	8	65.3	9	65.3	5	99.0	94.03	197	5	1	LG M65
CHRIS	58.5	21.6	2	92	27	1.88	17.8	2	57.7	0.52	17.4	2	8	65.3	9	65.3	5	100.5	90.09	195	2	4	M65
ERA	57.0	21.1	2	91	7	2.01	16.4	5	59.2	0.60	15.6	2	5	64.2	8	64.2	3	99.0	87.05	216	6	1	MP BA 00
FLETCHER	57.0	24.6	2	94	4	2.02	16.7	4	55.6	0.59	16.2	2	6	64.7	8	64.7	3	100.7	88.05	219	4	2	MP EX M65 00
JUSTIN	59.0	23.8	2	91	47	2.07	17.1	3	56.8	0.53	17.2	2	2	66.3	8	66.3	3	100.7	87.05	195	4	3	SM 00
MARQUIS	59.0	23.4	2	56	42	2.08	17.4	3	58.3	0.54	16.9	2	2	64.4	5	64.4	4	100.0	87.07	193	4	3	SM BA
NEEPANA	57.0	22.7	1	94	5	2.02	18.6	3	57.5	0.59	17.9	2	5	64.2	3	64.2	3	100.5	87.01	190	6	1	LG M65 BA
SELKIRK	55.0	23.0	1	96	3	2.04	17.5	4	60.6	0.58	17.2	1	3	64.7	5	64.7	4	99.2	90.10	187	4	3	LG M65 00
W1812	55.0	23.0	1	96	3	2.04	17.5	4	60.6	0.58	17.2	1	3	64.7	5	64.7	4	99.2	90.10	187	4	3	LG M65 00
W1823	55.0	19.3	0	86	14	2.07	16.6	8	53.2	0.63	15.1	3	8	65.0	6	65.0	4	99.0	90.10	217	2	1	TM KW MP PD
MT6830	55.0	21.1	1	93	6	2.02	16.5	6	55.9	0.58	15.9	2	5	65.7	6	65.7	3	100.7	87.07	212	4	2	TM LG MP EX M65 00
MT6834	55.0	19.9	0	91	19	1.99	16.8	8	53.0	0.63	16.1	2	8	66.3	7	66.3	3	101.7	80.05	214	4	2	LG EX M65
MT6839	56.0	21.9	0	91	19	1.99	16.8	8	53.0	0.63	16.1	2	8	66.3	7	66.3	3	101.7	80.05	214	4	2	LG EX M65
N0487	56.0	25.4	4	90	6	2.16	17.8	3	61.2	0.59	17.1	1	4	67.0	7	67.0	3	100.7	88.07	205	5	3	TM MM MT 00
N0490	57.5	25.9	11	85	4	2.05	17.7	2	60.9	0.59	16.9	1	4	65.0	6	65.0	3	99.0	90.09	220	4	2	M65 00
N0491	57.5	26.0	11	85	4	2.08	17.7	2	60.3	0.59	17.0	1	4	66.0	6	66.0	3	99.0	85.09	215	4	2	M65 00
N0499	60.0	26.3	6	90	4	1.99	16.8	3	62.0	0.53	16.1	1	2	65.3	8	65.3	3	99.0	90.99	202	4	3	00
S0579	57.0	27.3	5	90	5	1.97	18.0	2	59.5	0.53	17.5	2	2	64.7	6	64.7	3	101.0	91.99	202	4	3	00
W18C271	57.0	21.1	1	83	16	2.03	17.8	3	60.9	0.53	17.4	1	2	65.0	10	65.0	4	102.0	88.99	215	8	1	LG
W18149	53.0	24.6	1	94	5	1.98	17.6	8	58.7	0.51	17.2	2	2	67.6	9	67.6	3	103.0	75.09	252	8	1	LG 00 GR
691157	53.0	17.3	1	77	22	2.23	17.2	8	55.4	0.61	16.8	2	8	64.2	8	64.2	3	99.0	85.09	220	7	1	KW LG MM EX BA MT 00
MATERTOWN, SOUTH OKLAHOTA																							
BONANZA	57.0	21.6	1	89	10	1.76	15.7	4	56.3	0.50	15.5	2	3	61.9	9	61.9	4	98.0	92.90	200	5	2	KW LG SM BA MT
CHRIS	58.5	22.8	2	95	3	1.76	15.8	2	58.2	0.47	15.5	1	2	64.2	4	64.2	4	102.5	91.70	200	4	3	00
ERA	59.0	24.6	3	94	3	1.76	16.0	2	59.5	0.50	15.3	1	2	64.2	6	64.2	3	103.5	85.09	209	4	3	00
FLETCHER	57.5	26.7	4	93	3	1.85	16.0	2	56.8	0.54	15.5	2	5	64.4	7	64.4	4	99.5	92.70	195	2	3	M65
JUSTIN	58.0	25.7	2	95	3	1.84	15.8	2	57.3	0.52	15.3	2	3	63.8	7	63.8	4	100.5	90.01	190	2	4	00
MARQUIS	58.0	23.8	1	92	7	1.88	14.8	5	54.0	0.53	13.8	2	8	60.3	4	60.3	4	100.5	91.99	185	8	1	LG MP M65
NEEPANA	57.5	23.3	1	95	4	1.79	16.4	3	58.2	0.51	15.9	2	3	62.3	4	62.3	4	101.5	89.09	198	6	2	LG BA 00
SELKIRK	55.0	23.6	1	92	7	1.85	15.4	4	58.7	0.52	14.8	1	3	62.3	5	62.3	4	100.5	91.70	195	6	2	TM LG BA 00
W1812	59.0	26.2	1	91	8	1.75	15.4	3	56.1	0.45	14.7	2	3	64.7	5	64.7	4	100.0	88.07	206	4	1	LG SM 00
W1823	56.5	20.5	0	91	9	1.84	14.4	8	55.4	0.52	13.5	2	4	61.6	6	61.6	3	99.0	86.07	202	6	1	KW SM MP EX BA 00
MT6830	57.0	23.2	2	94	4	1.75	14.8	4	56.8	0.51	13.8	2	3	62.3	6	62.3	5	96.0	88.09	220	6	2	MP BA 00 COL
MT6834	56.5	20.1	0	92	8	1.73	14.3	8	53.7	0.54	13.3	2	8	62.5	5	62.5	4	102.0	89.99	195	2	1	KW SM MP M65
MT6839	58.5	24.0	0	91	9	1.91	15.8	8	54.9	0.50	15.0	2	4	64.2	5	64.2	3	101.5	91.09	197	4	1	KW SM EX 00
N0487	56.0	27.8	9	90	1	1.84	15.7	2	57.0	0.49	15.0	2	3	61.9	7	61.9	5	99.0	88.05	205	6	2	BA 00
N0491	59.0	28.4	14	84	2	1.84	15.6	2	57.7	0.48	14.4	2	2	61.3	7	61.3	4	100.0	87.09	197	5	3	BA
N0496	60.0	25.2	13	90	7	1.74	16.8	2	58.6	0.54	16.1	1	4	65.7	6	65.7	5	98.0	91.99	185	4	2	M65 00
N0499	57.0	25.2	13	90	7	1.74	16.8	2	58.6	0.54	16.1	1	4	65.7	6	65.7	5	98.0	91.99	185	4	2	M65 00
S0579	57.5	31.0	25	72	3	1.72	15.9	2	58.6	0.50	15.5	2	2	61.9	8	61.9	4	103.0	85.05	201	5	3	BA
W18C271	57.5	24.2	3	88	9	1.72	17.0	3	57.7	0.53	16.5	2	3	65.7	9	65.7	7	98.2	82.05	212	4	3	SM M65 00
W18149	57.0	24.6	3	92	5	1.66	15.8	2	58.2	0.53	15.6	2	3	66.3	10	66.3	3	101.5	93.07	230	5	2	M65 MT 00
691137	53.5	19.3	2	85	13	1.87	16.5	4	56.5	0.56	15.8	2	8	64.2	10	64.2	3	99.0	88.09	202	6	1	KW SM MT 00

1/ CLEAN ORY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 1% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = QUESTIONABLE, 4 = QUESTIONABLE-QUESTIONABLE, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = QUESTIONABLE, 4 = QUESTIONABLE-QUESTIONABLE, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

5/ REFER TO REFERENCE MIXINGGRAMS FOR NUMERICAL CURVE PATTERNS. (1 = VERY WEAK, 2 = WEAK, 3 = PLIABLE-WEAK, 4 = PLIABLE-ELASTIC, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-P LIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAO, 30 = DEAO.

6/ 1 = BUCKY, 2 = VERY BUCKY, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-P LIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAO, 30 = DEAO.

7/ XXX.9 = BRIGHT WHITE, XXX.8 = WHITE, XXX.7 = SLIGHTLY CREAMY, XXX.6 = BRIGHT CREAMY, XXX.5 = CREAMY, XXX.4 = VERY CREAMY, XXX.3 = GRAY, XXX.2 = DULL GRAY, XXX.1 = VERY GRAY.

8/ XXX.00 = SOGGY, XXX.01 = THICK MALL OR HADSH, XXX.03 = CLOSE, XXX.05 = OPEN, XXX.06 = OPEN, XXX.07 = IRREGULAR, XXX.08 = OPEN, XXX.09 = OPEN, XXX.10 = IRREGULAR, XXX.20 = OPEN, XXX.30 = SLIGHTLY OPEN-IRREGULAR, XXX.40 = OPEN, XXX.50 = OPEN, XXX.60 = OPEN, XXX.70 = OPEN, XXX.80 = OPEN, XXX.90 = OPEN, XXX.99 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.



QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

VARIETY OR SEL. NO.		T.M.		1000 KERNEL SIZE		WHT.		WHT. PRO.		KERN. PRO.		FLR. EXT.		FLR. MIN.		FLR. PRO.		MLG. CHAR.		MLG. PER.		ABS. PAT.		MIX. ABS.		BAKE TIME		MIX. TIME		DOUGH CHAR.		CRUMB COLOR		CRUMB GRAIN		LOAF BAKE VOL.		GEN. EVAL.		MINOR DEFICIENCY		MAJOR DEFICIENCY			
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6		7/7		8/8		9/9		10/10		11/11		12/12		13/13		14/14		15/15		16/16		17/17		18/18		19/19		20/20	
		1/1		G.		1/1		2/2		3/3		4/4		5/5		6/6																													

11/ CLEAN DRY - SUBTRACT 1 LB./8U. FOR COCKAGE-FREE T.W.

1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE, 5 = QUESTIONABLE-UNSATISFACTORY, 6 = UNSATISFACTORY, 7 = UNSATISFACTORY-UNSATISFACTORY, 8 = UNSATISFACTORY-VERY UNSATISFACTORY.

1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

REFER TO REFERENCE MIXIGRAMS FOR NUMERICAL CURVE PATTERN. 11 = VERY WEAR --- 12 = VERY STRONG

1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE,

XXX.9 = BRIGHT WHITE, XXX.8 = WHITE.	XXX.6 = BRIGHT CREAMY,
XXX.7 = SUGAR	XXX.5 = CREAMY,
XXX.6 = BRIGHT CREAMY,	XXX.4 = VERY CREAMY,
XXX.5 = CREAMY,	XXX.3 = GRAY,
XXX.4 = VERY CREAMY,	XXX.2 = OULL GRAY,
XXX.3 = GRAY,	XXX.1 = VERY GRAY.
XXX.2 = OULL GRAY,	
XXX.1 = VERY GRAY.	

[illegible]

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.



1970 CROP

CLEAN ORY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.
 1 XZ MOISTURE BASIS.
 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.
 1 XZ REFERENCE MICROGRAPHS FOR NUMERICAL CURVE PATTERN: (1) = VERY WEAK, (2) = WEAK, (3) = MODERATELY WEAK, (4) = WEAK, (5) = MODERATELY WEAK, (6) = WEAK, (7) = MODERATELY WEAK, (8) = WEAK, (9) = MODERATELY WEAK, (10) = WEAK, (11) = VERY STRONG.
 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY DEAD, 30 = DEAD.
 XXX-9 = BRIGHT WHITE, XXX-8 = WHITE, XXX-7 = SLIGHTLY CREAMY, XXX-6 = BRIGHT CREAMY, XXX-5 = CREAMY, XXX-4 = DULL GRAY, XXX-3 = GRAY, XXX-2 = VERY GRAY, XXX-1 = VERY GRAY.
 XXX-10 = SLIGHTLY IRREGULAR, XXX-9 = IRREGULAR, XXX-8 = SLIGHTLY IRREGULAR, XXX-7 = IRREGULAR, XXX-6 = SLIGHTLY IRREGULAR, XXX-5 = IRREGULAR, XXX-4 = IRREGULAR, XXX-3 = IRREGULAR, XXX-2 = IRREGULAR, XXX-1 = IRREGULAR.
 XXX-50 = SLIGHTLY PROMISE, XXX-40 = SLIGHTLY PROMISE, XXX-30 = SLIGHTLY PROMISE, XXX-20 = SLIGHTLY PROMISE, XXX-10 = SLIGHTLY PROMISE, XXX-0 = PROMISE.
 10 = PROMISE, 2 = SOME PROMISE, 4 = GOOD PROMISE.
 10 = PROMISE, 2 = SOME PROMISE, 4 = GOOD PROMISE.



VARIETY OR SEL. NO.	T.W. #/BU.	1000 KWT.	KERNEL SIZE			WHT. MIN.	WHT. PRO.	KERN. EXT.	FLR. PRO.	MLG. PER.	MIX. ABS.	MIX. PAT.	BAKE ABS.	MIX. MIN.	DOUGH CHAR.	CRUMBS COLOR	CRUMBS GRAIN	LOAF BAKE VOL.	BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY		MAJOR DEFICIENCY	
			LG	MEQ	SM																CC.	SM	GR	WM
LARAMIE, WYOMING																								
BONANZA	64.0	35.1	57	42	1	1.65	16.1	2	62.1	0.51	15.9	1	2	62.3	3	62.3	3	62.3	3	62.3	3	62.3	3	62.3
CHRIS	63.0	32.6	59	40	1	1.63	13.8	2	60.0	0.52	13.6	1	3	62.3	2	62.3	2	62.3	2	62.3	2	62.3	2	62.3
ERA	64.0	33.0	64	35	1	1.71	12.8	5	64.5	0.50	12.0	1	2	59.7	2	59.7	2	59.7	2	59.7	2	59.7	2	59.7
FLETCHER	64.0	33.4	76	21	3	1.69	13.5	4	60.7	0.52	12.4	2	3	60.3	2	60.3	2	60.3	2	60.3	2	60.3	2	60.3
JUSTIN	62.0	34.8	69	29	2	1.76	14.1	2	59.7	0.51	13.9	2	3	62.5	3	62.5	3	62.5	3	62.5	3	62.5	3	62.5
MARQUIS	62.0	36.0	53	29	2	1.72	14.0	2	58.2	0.59	13.7	2	8	61.9	2	61.9	2	61.9	2	61.9	2	61.9	2	61.9
NEEDHAM	62.0	32.8	57	42	1	1.68	15.6	3	59.4	0.52	15.2	2	3	61.9	2	61.9	2	61.9	2	61.9	2	61.9	2	61.9
SELKIRK	62.0	36.5	65	37	1	1.72	14.9	2	62.3	0.52	14.4	2	2	62.5	2	62.5	2	62.5	2	62.5	2	62.5	2	62.5
WELSH	64.0	36.2	62	37	1	1.81	15.0	2	59.7	0.48	14.2	2	3	63.2	2	63.2	2	63.2	2	63.2	2	63.2	2	63.2
MT 6723	63.0	32.3	55	42	3	1.67	11.9	8	59.7	0.53	11.3	1	3	59.3	2	59.3	2	59.3	2	59.3	2	59.3	2	59.3
MT 6830	63.0	39.1	74	24	2	1.59	12.9	5	58.5	0.53	12.6	2	4	61.6	2	61.6	2	61.6	2	61.6	2	61.6	2	61.6
MT 6834	61.0	40.3	77	22	1	1.67	11.4	8	56.1	0.59	10.6	2	8	58.1	1	58.1	1	58.1	1	58.1	1	58.1	1	58.1
MT 6839	62.0	39.4	63	36	1	1.79	13.2	2	60.8	0.42	14.5	1	1	64.7	3	64.7	3	64.7	3	64.7	3	64.7	3	64.7
N0487	62.5	38.2	57	41	2	1.74	13.5	3	60.1	0.47	13.0	1	2	63.2	2	63.2	2	63.2	2	63.2	2	63.2	2	63.2
N0490	63.0	38.9	81	18	1	1.78	13.5	4	59.7	0.48	13.0	1	2	62.3	2	62.3	2	62.3	2	62.3	2	62.3	2	62.3
N0491	63.5	36.8	61	36	3	1.62	12.9	6	60.8	0.47	12.1	1	2	61.9	2	61.9	2	61.9	2	61.9	2	61.9	2	61.9
N0496	63.0	50.5	84	5	1	1.63	14.5	2	60.5	0.43	13.8	1	1	64.2	7	64.2	7	64.2	7	64.2	7	64.2	7	64.2
N0499	60.0	24.7	5	86	9	1.61	13.9	8	62.4	0.44	13.2	1	1	62.3	7	62.3	7	62.3	7	62.3	7	62.3	7	62.3
N0579	63.5	56.1	88	10	2	1.70	13.6	4	59.7	0.43	12.8	1	2	62.5	3	62.5	3	62.5	3	62.5	3	62.5	3	62.5
M5C271	63.0	38.5	67	30	3	1.73	13.2	5	58.5	0.51	12.5	2	3	62.8	3	62.8	3	62.8	3	62.8	3	62.8	3	62.8
H678169	63.0	31.5	53	45	2	1.67	12.7	6	58.7	0.55	12.0	2	5	61.3	2	61.3	2	61.3	2	61.3	2	61.3	2	61.3
591157																								
SHERIDAN, WYOMING																								
BONANZA	55.0	18.4	1	26	73	1.69	15.1	8	55.4	0.53	14.5	2	8	60.3	7	60.3	7	60.3	7	60.3	7	60.3	7	60.3
CHRIS	60.0	22.8	7	86	7	1.67	16.2	3	59.5	0.41	15.7	1	2	62.8	3	62.8	3	62.8	3	62.8	3	62.8	3	62.8
ERA	60.0	22.8	7	86	7	1.67	16.2	3	59.5	0.41	15.7	1	2	62.8	3	62.8	3	62.8	3	62.8	3	62.8	3	62.8
FLETCHER	60.5	27.6	14	80	6	1.67	14.5	5	57.9	0.45	13.6	2	5	60.7	4	60.7	4	60.7	4	60.7	4	60.7	4	60.7
JUSTIN	59.0	24.7	11	80	9	1.65	16.2	3	59.9	0.43	15.5	1	2	63.5	5	63.5	5	63.5	5	63.5	5	63.5	5	63.5
MARQUIS	60.5	23.0	7	85	8	1.62	14.9	5	58.0	0.46	14.0	2	5	61.3	4	61.3	4	61.3	4	61.3	4	61.3	4	61.3
NEEDHAM	59.0	21.2	2	89	9	1.56	16.0	8	59.6	0.47	13.6	1	3	61.0	3	61.0	3	61.0	3	61.0	3	61.0	3	61.0
SELKIRK	58.5	25.3	7	85	8	1.66	14.8	5	61.0	0.45	14.1	1	3	60.0	3	60.0	3	60.0	3	60.0	3	60.0	3	60.0
M51812	62.0	26.7	2	85	13	1.68	14.4	8	56.3	0.43	13.8	2	5	63.5	4	63.5	4	63.5	4	63.5	4	63.5	4	63.5
M76723	57.5	20.5	1	78	21	1.58	15.2	8	55.3	0.48	14.3	2	8	61.0	4	61.0	4	61.0	4	61.0	4	61.0	4	61.0
MT6830	59.0	36.9	9	82	9	1.64	14.8	4	56.4	0.43	14.0	2	5	60.7	3	60.7	3	60.7	3	60.7	3	60.7	3	60.7
MT6834	58.0	20.1	1	80	19	1.50	14.7	8	54.5	0.49	13.7	2	8	60.7	4	60.7	4	60.7	4	60.7	4	60.7	4	60.7
MT6839	58.0	28.6	3	89	8	1.63	14.6	6	55.3	0.41	13.7	2	8	60.7	4	60.7	4	60.7	4	60.7	4	60.7	4	60.7
N0487	61.5	31.8	21	75	4	1.60	14.7	4	59.9	0.43	14.1	1	2	60.3	5	60.3	5	60.3	5	60.3	5	60.3	5	60.3
N0490	60.5	28.6	22	75	3	1.64	14.5	4	59.9	0.41	13.5	1	2	60.3	5	60.3	5	60.3	5	60.3	5	60.3	5	60.3
N0491	59.5	27.4	15	80	5	1.66	15.4	2	59.8	0.43	14.2	1	2	61.3	5	61.3	5	61.3	5	61.3	5	61.3	5	61.3
N0496	61.0	25.1	3	86	11	1.39	13.8	8	60.3	0.45	12.8	1	3	61.9	4	61.9	4	61.9	4	61.9	4	61.9	4	61.9
N0499	59.5	24.0	11	82	7	1.51	15.3	2	59.8	0.45	13.9	2	3	61.3	6	61.3	6	61.3	6	61.3	6	61.3	6	61.3
S0579	58.5	30.1	18	76	6	1.38	14.4	5	60.4	0.43	14.0	1	2	61.3	7	61.3	7	61.3	7	61.3	7	61.3	7	61.3
M5C271	61.0	25.6	3	89	8	1.55	13.8	8	61.4	0.44	13.1	1	2	60.0	7	60.0	7	60.0	7	60.0	7	60.0	7	60.0
H678169	60.5	26.4	5	90	5	1.46	14.2	6	59.6	0.42	13.3	2	2	64.2	7	64.2	7	64.2	7	64.2	7	64.2	7	64.2
591157	56.5	21.3	2	70	28	1.67	15.6	8	57.2	0.51	14.5	2	8	64.4	10	64.4	10	64.4	10	64.4	10	64.4	10	64.4

1/ CLEAN ORY - SUBTRACT 1 LB./BU. FOR DOCKAGE-FREE T.W.

2/ 1% MOISTURE BASIS

3/ 1% VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT.

5/ REFER TO REFERENCE MIXOGRAMS FOR NUMERICAL CURVE PATTERNS. 11 = VERY WEAK, 12 = VERY STRONG.

6/ XXX.0 = BRIGHT WHITE, XXX.1 = SLIGHTLY GREY, XXX.2 = SLIGHTLY GREY, XXX.3 = SLIGHTLY GREY, XXX.4 = SLIGHTLY GREY, XXX.5 = SLIGHTLY GREY, XXX.6 = SLIGHTLY GREY, XXX.7 = SLIGHTLY GREY, XXX.8 = SLIGHTLY GREY, XXX.9 = SLIGHTLY GREY, XXX.10 = SLIGHTLY GREY, XXX.11 = SLIGHTLY GREY, XXX.12 = SLIGHTLY GREY, XXX.13 = SLIGHTLY GREY, XXX.14 = SLIGHTLY GREY, XXX.15 = SLIGHTLY GREY, XXX.16 = SLIGHTLY GREY, XXX.17 = SLIGHTLY GREY, XXX.18 = SLIGHTLY GREY, XXX.19 = SLIGHTLY GREY, XXX.20 = SLIGHTLY GREY, XXX.21 = SLIGHTLY GREY, XXX.22 = SLIGHTLY GREY, XXX.23 = SLIGHTLY GREY, XXX.24 = SLIGHTLY GREY, XXX.25 = SLIGHTLY GREY, XXX.26 = SLIGHTLY GREY, XXX.27 = SLIGHTLY GREY, XXX.28 = SLIGHTLY GREY, XXX.29 = SLIGHTLY GREY, XXX.30 = SLIGHTLY GREY, XXX.31 = SLIGHTLY GREY, XXX.32 = SLIGHTLY GREY, XXX.33 = SLIGHTLY GREY, XXX.34 = SLIGHTLY GREY, XXX.35 = SLIGHTLY GREY, XXX.36 = SLIGHTLY GREY, XXX.37 = SLIGHTLY GREY, XXX.38 = SLIGHTLY GREY, XXX.39 = SLIGHTLY GREY, XXX.40 = SLIGHTLY GREY, XXX.41 = SLIGHTLY GREY, XXX.42 = SLIGHTLY GREY, XXX.43 = SLIGHTLY GREY, XXX.44 = SLIGHTLY GREY, XXX.45 = SLIGHTLY GREY, XXX.46 = SLIGHTLY GREY, XXX.47 = SLIGHTLY GREY, XXX.48 = SLIGHTLY GREY, XXX.49 = SLIGHTLY GREY, XXX.50 = SLIGHTLY GREY, XXX.51 = SLIGHTLY GREY, XXX.52 = SLIGHTLY GREY, XXX.53 = SLIGHTLY GREY, XXX.54 = SLIGHTLY GREY, XXX.55 = SLIGHTLY GREY, XXX.56 = SLIGHTLY GREY, XXX.57 = SLIGHTLY GREY, XXX.58 = SLIGHTLY GREY, XXX.59 = SLIGHTLY GREY, XXX.60 = SLIGHTLY GREY, XXX.61 = SLIGHTLY GREY, XXX.62 = SLIGHTLY GREY, XXX.63 = SLIGHTLY GREY, XXX.64 = SLIGHTLY GREY, XXX.65 = SLIGHTLY GREY, XXX.66 = SLIGHTLY GREY, XXX.67 = SLIGHTLY GREY, XXX.68 = SLIGHTLY GREY, XXX.69 = SLIGHTLY GREY, XXX.70 = SLIGHTLY GREY, XXX.71 = SLIGHTLY GREY, XXX.72 = SLIGHTLY GREY, XXX.73 = SLIGHTLY GREY, XXX.74 = SLIGHTLY GREY, XXX.75 = SLIGHTLY GREY, XXX.76 = SLIGHTLY GREY, XXX.77 = SLIGHTLY GREY, XXX.78 = SLIGHTLY GREY, XXX.79 = SLIGHTLY GREY, XXX.80 = SLIGHTLY GREY, XXX.81 = SLIGHTLY GREY, XXX.82 = SLIGHTLY GREY, XXX.83 = SLIGHTLY GREY, XXX.84 = SLIGHTLY GREY, XXX.85 = SLIGHTLY GREY, XXX.86 = SLIGHTLY GREY, XXX.87 = SLIGHTLY GREY, XXX.88 = SLIGHTLY GREY, XXX.89 = SLIGHTLY GREY, XXX.90 = SLIGHTLY GREY, XXX.91 = SLIGHTLY GREY, XXX.92 = SLIGHTLY GREY, XXX.93 = SLIGHTLY GREY, XXX.94 = SLIGHTLY GREY, XXX.95 = SLIGHTLY GREY, XXX.96 = SLIGHTLY GREY, XXX.97 = SLIGHTLY GREY, XXX.98 = SLIGHTLY GREY, XXX.99 = SLIGHTLY GREY, XXX.100 = SLIGHTLY GREY.

7/ XXX.00 = SOFT, XXX.01 = THICK WALL OR HARSH, XXX.02 = CLOSE, XXX.03 = OPEN, XXX.04 = OPEN, XXX.05 = OPEN, XXX.06 = OPEN, XXX.07 = OPEN, XXX.08 = OPEN, XXX.09 = OPEN, XXX.10 = OPEN, XXX.11 = OPEN, XXX.12 = OPEN, XXX.13 = OPEN, XXX.14 = OPEN, XXX.15 = OPEN, XXX.16 = OPEN, XXX.17 = OPEN, XXX.18 = OPEN, XXX.19 = OPEN, XXX.20 = OPEN, XXX.21 = OPEN, XXX.22 = OPEN, XXX.23 = OPEN, XXX.24 = OPEN, XXX.25 = OPEN, XXX.26 = OPEN, XXX.27 = OPEN, XXX.28 = OPEN, XXX.29 = OPEN, XXX.30 = OPEN, XXX.31 = OPEN, XXX.32 = OPEN, XXX.33 = OPEN, XXX.34 = OPEN, XXX.35 = OPEN, XXX.36 = OPEN, XXX.37 = OPEN, XXX.38 = OPEN, XXX.39 = OPEN, XXX.40 = OPEN, XXX.41 = OPEN, XXX.42 = OPEN, XXX.43 = OPEN, XXX.44 = OPEN, XXX.45 = OPEN, XXX.46 = OPEN, XXX.47 = OPEN, XXX.48 = OPEN, XXX.49 = OPEN, XXX.50 = OPEN, XXX.51 = OPEN, XXX.52 = OPEN, XXX.53 = OPEN, XXX.54 = OPEN, XXX.55 = OPEN, XXX.56 = OPEN, XXX.57 = OPEN, XXX.58 = OPEN, XXX.59 = OPEN, XXX.60 = OPEN, XXX.61 = OPEN, XXX.62 = OPEN, XXX.63 = OPEN, XXX.64 = OPEN, XXX.65 = OPEN, XXX.66 = OPEN, XXX.67 = OPEN, XXX.68 = OPEN, XXX.69 = OPEN, XXX.70 = OPEN, XXX.71 = OPEN, XXX.72 = OPEN, XXX.73 = OPEN, XXX.74 = OPEN, XXX.75 = OPEN, XXX.76 = OPEN, XXX.77 = OPEN, XXX.78 = OPEN, XXX.79 = OPEN, XXX.80 = OPEN, XXX.81 = OPEN, XXX.82 = OPEN, XXX.83 = OPEN, XXX.84 = OPEN, XXX.85 = OPEN, XXX.86 = OPEN, XXX.87 = OPEN, XXX.88 = OPEN, XXX.89 = OPEN, XXX.90 = OPEN, XXX.91 = OPEN, XXX.92 = OPEN, XXX.93 = OPEN, XXX.94 = OPEN, XXX.95 = OPEN, XXX.96 = OPEN, XXX.97 = OPEN, XXX.98 = OPEN, XXX.99 = OPEN, XXX.100 = OPEN.

8/ XXX.50 = SLIGHTLY IRREGULAR, XXX.60 = SLIGHTLY IRREGULAR, XXX.70 = SLIGHTLY IRREGULAR, XXX.80 = SLIGHTLY IRREGULAR, XXX.90 = SLIGHTLY IRREGULAR, XXX.100 = SLIGHTLY IRREGULAR.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.

10/ 1 = VERY WEAK, 2 = WEAK, 3 = SLIGHTLY WEAK, 4 = WEAK, 5 = SLIGHTLY WEAK, 6 = WEAK, 7 = SLIGHTLY WEAK, 8 = WEAK, 9 = SLIGHTLY WEAK, 10 = VERY WEAK, 11 = VERY WEAK, 12 = VERY WEAK, 13 = VERY WEAK, 14 = VERY WEAK, 15 = VERY WEAK, 16 = VERY WEAK, 17 = VERY WEAK, 18 = VERY WEAK, 19 = VERY WEAK, 20 = VERY WEAK, 21 = VERY WEAK, 22 = VERY WEAK, 23 = VERY WEAK, 24 = VERY WEAK, 2

QUALITY QA7A ON UNIFORM REGIONAL NURSERY SAMPLES

1970 CROP

VARIETY OR SEED NO.	T.W. KWT.	1000 KWT.	KERNEL SIZE			WHT. MIN.	WHT. PRO.	KERN. CHAR.	FLR. EXT.	MIN-2. 52EX.	FLR. PRO.	MUC. CHAR.	MUC. PER.	MIX. ABS.	MIX. PAT.	BAKE TIME	MIX. TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF BAKE VOL.	GEN- EVAL.	MAJOR DEFICIENCY																																																																																																																																																																																																																																																																																					
			LC	MEQ	SD																			3/ 97	6/ 17	9/ 27	2/ 27	3/ 51	4/ 31	5/ 31	6/ 31	7/ 31	8/ 31	9/ 31	10/ 31	11/ 31	12/ 31	13/ 31	14/ 31	15/ 31	16/ 31	17/ 31	18/ 31	19/ 31	20/ 31	21/ 31	22/ 31	23/ 31	24/ 31	25/ 31	26/ 31	27/ 31	28/ 31	29/ 31	30/ 31	31/ 31	32/ 31	33/ 31	34/ 31	35/ 31	36/ 31	37/ 31	38/ 31	39/ 31	40/ 31	41/ 31	42/ 31	43/ 31	44/ 31	45/ 31	46/ 31	47/ 31	48/ 31	49/ 31	50/ 31	51/ 31	52/ 31	53/ 31	54/ 31	55/ 31	56/ 31	57/ 31	58/ 31	59/ 31	60/ 31	61/ 31	62/ 31	63/ 31	64/ 31	65/ 31	66/ 31	67/ 31	68/ 31	69/ 31	70/ 31	71/ 31	72/ 31	73/ 31	74/ 31	75/ 31	76/ 31	77/ 31	78/ 31	79/ 31	80/ 31	81/ 31	82/ 31	83/ 31	84/ 31	85/ 31	86/ 31	87/ 31	88/ 31	89/ 31	90/ 31	91/ 31	92/ 31	93/ 31	94/ 31	95/ 31	96/ 31	97/ 31	98/ 31	99/ 31	100/ 31	101/ 31	102/ 31	103/ 31	104/ 31	105/ 31	106/ 31	107/ 31	108/ 31	109/ 31	110/ 31	111/ 31	112/ 31	113/ 31	114/ 31	115/ 31	116/ 31	117/ 31	118/ 31	119/ 31	120/ 31	121/ 31	122/ 31	123/ 31	124/ 31	125/ 31	126/ 31	127/ 31	128/ 31	129/ 31	130/ 31	131/ 31	132/ 31	133/ 31	134/ 31	135/ 31	136/ 31	137/ 31	138/ 31	139/ 31	140/ 31	141/ 31	142/ 31	143/ 31	144/ 31	145/ 31	146/ 31	147/ 31	148/ 31	149/ 31	150/ 31	151/ 31	152/ 31	153/ 31	154/ 31	155/ 31	156/ 31	157/ 31	158/ 31	159/ 31	160/ 31	161/ 31	162/ 31	163/ 31	164/ 31	165/ 31	166/ 31	167/ 31	168/ 31	169/ 31	170/ 31	171/ 31	172/ 31	173/ 31	174/ 31	175/ 31	176/ 31	177/ 31	178/ 31	179/ 31	180/ 31	181/ 31	182/ 31	183/ 31	184/ 31	185/ 31	186/ 31	187/ 31	188/ 31	189/ 31	190/ 31	191/ 31	192/ 31	193/ 31	194/ 31	195/ 31	196/ 31	197/ 31	198/ 31	199/ 31	200/ 31	201/ 31	202/ 31	203/ 31	204/ 31	205/ 31	206/ 31	207/ 31	208/ 31	209/ 31	210/ 31	211/ 31	212/ 31	213/ 31	214/ 31	215/ 31	216/ 31	217/ 31	218/ 31	219/ 31	220/ 31	221/ 31	222/ 31	223/ 31	224/ 31	225/ 31	226/ 31	227/ 31	228/ 31	229/ 31	230/ 31	231/ 31	232/ 31	233/ 31	234/ 31	235/ 31	236/ 31	237/ 31	238/ 31	239/ 31	240/ 31	241/ 31	242/ 31	243/ 31	244/ 31	245/ 31	246/ 31	247/ 31	248/ 31	249/ 31	250/ 31	251/ 31	252/ 31	253/ 31	254/ 31	255/ 31	256/ 31	257/ 31	258/ 31	259/ 31	260/ 31	261/ 31	262/ 31	263/ 31	264/ 31	265/ 31	266/ 31	267/ 31	268/ 31	269/ 31	270/ 31	271/ 31	272/ 31	273/ 31	274/ 31	275/ 31



1970 CROP

VARIETY OR SEL. NO.	T-M	1000 KERN. SIZE		WMT. MIN.	WMT. MAX.	KERN. CHAR.	ELR. EXT.	MIN-3 OSTER.	ELR. PRO.	WLG. PER.	MUC. PER.	MIX. ABS.	MIX. PAT.	BAKE ABS.	MIX. TIME	DOUGH CHAR.	COUMS COLOR	COUMS GRAIN	LOAF VOL.	BAKE EVAL.	GEN. EVAL.	MAJOR DEFICIENCY	
		NO.	GR.																				CC.
STATE AVERAGES FOR MINNESOTA																							
CHRIS	61.5	25-8	12	82	6	1.82	14.6	2	59.8	0.53	14.2	1	2	62.8	4	62.8	6	100.0	90.70	183	2	4	
JUSTIN	59.0	25-5	18	73	9	1.96	15.2	2	60.0	0.53	14.6	1	3	64.5	5	64.5	5	101.7	94.50	187	2	4	
DELUK	57.8	26-9	11	81	8	1.91	14.2	3	61.1	0.54	13.7	1	3	62.6	4	62.6	6	99.0	92.50	182	2	4	
STATE AVERAGES FOR MONTANA																							
CHRIS	62.7	27-7	26	71	3	1.54	15.1	3	60.6	0.46	14.5	1	3	62.6	3	62.6	5	103.5	93.70	187	2	4	
JUSTIN	62.7	31-9	34	2	1.62	15.7	2	59.1	0.44	15.0	2	3	63.9	4	63.9	3	103.0	95.07	192	2	4		
DELUK	60.7	31.1	32	65	3	1.61	14.6	4	61.0	0.46	14.0	1	3	61.3	3	61.3	6	100.0	92.99	181	3	2	
STATE AVERAGES FOR NORTH DAKOTA																							
CHRIS	61.2	26-2	16	79	5	1.71	16.3	3	61.5	0.45	15.4	1	2	64.0	5	64.0	4	103.5	91.50	199	2	4	
JUSTIN	59.9	26-7	16	75	5	1.70	15.2	4	62.4	0.48	14.7	1	3	63.3	4	63.3	6	99.3	92.70	182	4	3	
DELUK	59.9	30-3	19	76	5	1.78	15.2	4	62.4	0.48	14.7	1	3	63.3	4	63.3	6	99.3	92.70	182	4	3	
STATE AVERAGES FOR SOUTH DAKOTA																							
CHRIS	58.5	22-2	2	94	4	1.82	14.8	2	58.0	0.50	16.4	1	2	64.8	5	64.8	3	101.5	91.70	198	2	4	
JUSTIN	58.5	24-8	2	73	25	1.96	16.8	3	57.1	0.53	16.3	2	3	65.1	8	65.1	4	100.7	89.03	193	2	4	
DELUK	55.0	23-3	1	94	5	1.95	16.5	3	59.7	0.55	16.0	1	3	63.5	5	63.5	5	100.5	91.50	191	3	3	
STATE AVERAGES FOR WASHINGTON																							
CHRIS	57.0	22-2	2	91	7	1.61	16.9	3	59.9	0.55	16.6	1	3	63.5	2	63.5	2	98.2	70.01	170	4	3	
JUSTIN	58.0	25-5	5	90	5	1.61	17.1	2	59.8	0.51	16.7	1	2	67.0	4	67.0	8	96.2	85.01	172	1	4	
DELUK	56.5	25-8	2	93	5	1.53	15.5	5	61.8	0.54	15.1	1	2	64.2	3	64.2	2	98.2	70.01	171	2	4	
STATE AVERAGES FOR WISCONSIN																							
CHRIS	58.5	28-8	22	75	3	1.69	17.2	3	58.8	0.51	16.7	2	4	64.2	3	64.2	3	100.0	85.09	217	4	2	
JUSTIN	59.0	30-8	44	53	3	1.76	17.1	2	60.4	0.48	16.6	2	2	64.7	6	64.7	4	99.0	88.09	196	2	4	
DELUK	57.0	31-7	39	59	2	1.61	15.8	4	60.4	0.46	15.1	2	2	62.3	3	62.3	4	90.99	90.99	189	6	2	
STATE AVERAGES FOR WYOMING																							
CHRIS	61.5	27-7	33	63	4	1.55	15.0	2	59.8	0.47	14.6	1	2	62.6	3	62.6	7	101.5	91.50	175	2	4	
JUSTIN	60.5	29-8	40	55	5	1.71	15.2	2	59.8	0.47	14.7	1	2	63.0	4	63.0	3	100.3	92.99	169	2	4	
DELUK	60.5	30-9	36	59	5	1.59	14.9	2	61.7	0.49	14.3	1	2	61.3	3	61.3	9	100.5	91.90	169	3	3	
STATE AVERAGES OF THE THREE VARIETIES																							
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1. CLEAN DRY - SUBTRACT 1 LB./80L. FOR DOCKAGE-FREE T.W.
1. 14% MOISTURE BASIS.
1. 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY
1. 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT
1. REFER TO REFERENCE MICROGRAMS FOR NUMERICAL, CLUSTE
1. 1 = 8UCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC
1. XXX-9 = SMOOTH, XXX-8 = WHITE, XXX-7 = SLIGHTLY
1. XXX-00 = BRIGT, XXX-01 = THICK WALL OR HARSH, XXX-03
1. XXX-50 = SLIGHTLY IRREGULAR/OPEN, XXX-70 = SLIGHTLY
1. 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE,
1. 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE,



TABLE 23
QUALITY DATA ON SAWFELY YIELD NURSERY SAMPLES

VARIETY OR SEL. NO.	T.M. 1/	1000 KWT			WHT. MIN.	WHT. PRO.	KERN. PRO.	KERN. CHAR.	FLR. EXT.	FLR. MIN.	FLR. 5%EX.	MLG. PRO.	MLG. CHAR.	MLG. PER.	MIX. ABS.	MIX. PAT.	BAKE ABS.	MIX. TIME	DOUGH CHAR.	CRUMB COLOR	CRUMB GRAIN	LOAF BAKE VOL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
		g	g	g																					
AVERAGE OF QUALITY DATA																									
CHINOOK	61-3	29.3	20	75	5	1.57	15.7	3	61.1	0.42	15.5	1	2	64.8	5	3.75	3	99.0	87.50	200	2	4			
ROCK	61-9	28.0	27	77	3	1.58	15.3	2	60.2	0.42	15.0	1	2	63.7	4	3.50	4	100.0	86.09	212	2	4			
THATCHER	61-2	26.1	16	77	4	1.58	15.4	3	60.5	0.45	15.1	1	3	65.1	4	3.50	4	101.5	89.30	217	2	4			
CN 2144	61-0	29.4	24	72	4	1.57	15.3	2	59.3	0.44	14.6	1	3	62.1	3	3.25	4	102.7	87.09	205	5	2			BA
CN 530411	62-3	31.5	38	59	3	1.56	15.3	2	61.4	0.42	14.6	1	2	63.0	4	3.25	4	102.7	90.70	198	4	3			M65
CN 754051	60-3	30.0	23	72	5	1.72	15.8	3	57.8	0.54	15.2	2	8	65.4	4	4.00	3	97.0	86.05	227	2	1			
CN 754133	61-0	28.2	19	77	4	1.77	15.8	3	61.1	0.46	15.2	1	3	64.4	4	4.00	4	100.7	90.50	211	2	4			
MT 6811	61-7	26.5	17	77	6	1.58	14.6	5	59.8	0.43	14.2	1	3	63.3	4	3.50	4	101.5	90.50	199	4	3			
MT 6812	61-7	27.6	18	77	5	1.58	14.4	6	62.1	0.44	14.0	1	2	63.2	4	3.50	4	100.0	89.70	210	4	3			
NO 6579	60-3	32.8	37	59	4	1.50	15.4	2	60.3	0.42	15.0	2	2	62.7	5	4.50	4	101.7	86.09	210	4	3			
NO 6662	61.5	34.7	38	59	3	1.60	15.9	2	60.6	0.41	15.7	1	2	63.8	4	3.00	3	101.0	85.07	230	2	4			
NO 6677	62.5	35.7	42	55	3	1.60	16.3	2	60.7	0.43	16.1	1	2	64.3	3	3.00	4	101.0	86.09	222	2	4			
NO 6723	61-3	36.9	39	59	2	1.59	16.5	2	58.9	0.49	16.3	2	8	64.7	4	4.00	4	101.0	86.09	223	2	1			EX M65
NO 6736	61-3	33.6	39	59	2	1.73	18.1	2	57.6	0.47	17.9	2	6	64.7	6	4.50	4	101.0	87.50	241	1	3			
NO 6763	60-8	31.4	31	66	3	1.63	17.0	2	58.1	0.47	16.8	2	6	65.4	5	3.75	4	100.0	88.50	229	2	3			
NO 6765	60-2	35.4	36	61	3	1.55	16.1	2	57.0	0.45	15.9	2	6	64.3	4	3.50	6	101.0	88.05	200	8	1			EX 00

1/ CLEAN ORY - SUBTRACT 1 LB./BU. FOR OCKAGE-FREE T.M.

2/ 1% MOISTURE BASIS.

3/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = QUESTIONABLE, 4 = QUESTIONABLE-QUESTIONABLE, 5 = QUESTIONABLE-UNSATISFACTORY, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

4/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

5/ REFER TO REFERENCE MICROGRAMS FOR NUMERICAL CURVE PATTERNS. (1 = VERY WEAK, ELASTIC, 2 = WEAK, 3 = PLIABLE-WEAK, 4 = VERY CREAMY, 5 = CREAMY, 6 = BRIGHT CREAMY, 7 = SLIGHTLY CREAMY, 8 = BRIGHT CREAMY, 9 = VERY CREAMY, 10 = VERY WEAK, 20 = SLIGHTLY OEO, 30 = OEO.

6/ XXX-0 = SOGGY, XXX-01 = THICK WALL OR HARSH, XXX-03 = CLOSE, XXX-05 = OPEN, SLIGHTLY IRREGULAR, XXX-06 = OPEN, SLIGHTLY IRREGULAR, XXX-07 = IRREGULAR, OPEN, XXX-09 = OPEN, XXX-10 = VERY GRAY, XXX-11 = VERY GRAY.

7/ XXX-9 = BRIGHT WHITE, XXX-8 = WHITE, XXX-7 = SLIGHTLY CREAMY, XXX-6 = BRIGHT CREAMY, XXX-5 = CREAMY, XXX-4 = VERY CREAMY, XXX-3 = GRAY, XXX-2 = DULL GRAY, XXX-1 = VERY GRAY.

8/ XXX-50 = SLIGHTLY IRREGULAR, OPEN, XXX-70 = SLIGHTLY OPEN, XXX-90 = SLIGHTLY IRREGULAR, XXX-99 = NORMAL.

9/ 1 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE.



